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ABSTRACT

This report focuses on the results of approximately twenty central studies of compensatory education completed before 1977 and presents the major results of those studies as they relate to important policy questions for Title I of the Elementary and Secondary Education Act. The results are presented first as they relate to the major tasks of Title I; participant selection, treatment delivery, and evaluation reporting. Then the results concerning program effectiveness are reviewed: overall effectiveness, variation in effectiveness as a function of treatment method, and variation in effectiveness across types of participants. Finally, a series of eight major problems in the implementation of compensatory education are identified and discussed. The information on overall program effectiveness, as measured in terms of increased achievement gains by program participants, has been less than adequate to determine the effectiveness of the program. Concerning variation in effectiveness among treatment methods, the data also leave room for methodological improvement. Concerning variation in effectiveness across population groups, little information is reported. The major problems listed for Title I include misuse of funds, lack of consistent federal regulations and guidelines, invalid evaluations, lack of parental involvement, lack of effective treatment methods, lack of knowledge about individual differences in the processes by which children acquire cognitive skills, and the exclusion of disadvantaged children in low income areas. (Author/AM)

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TITLE I, 1965–1975: A SYNTHESIS OF THE FINDINGS OF FEDERAL STUDIES

Donald H. McLaughlin

July 1977

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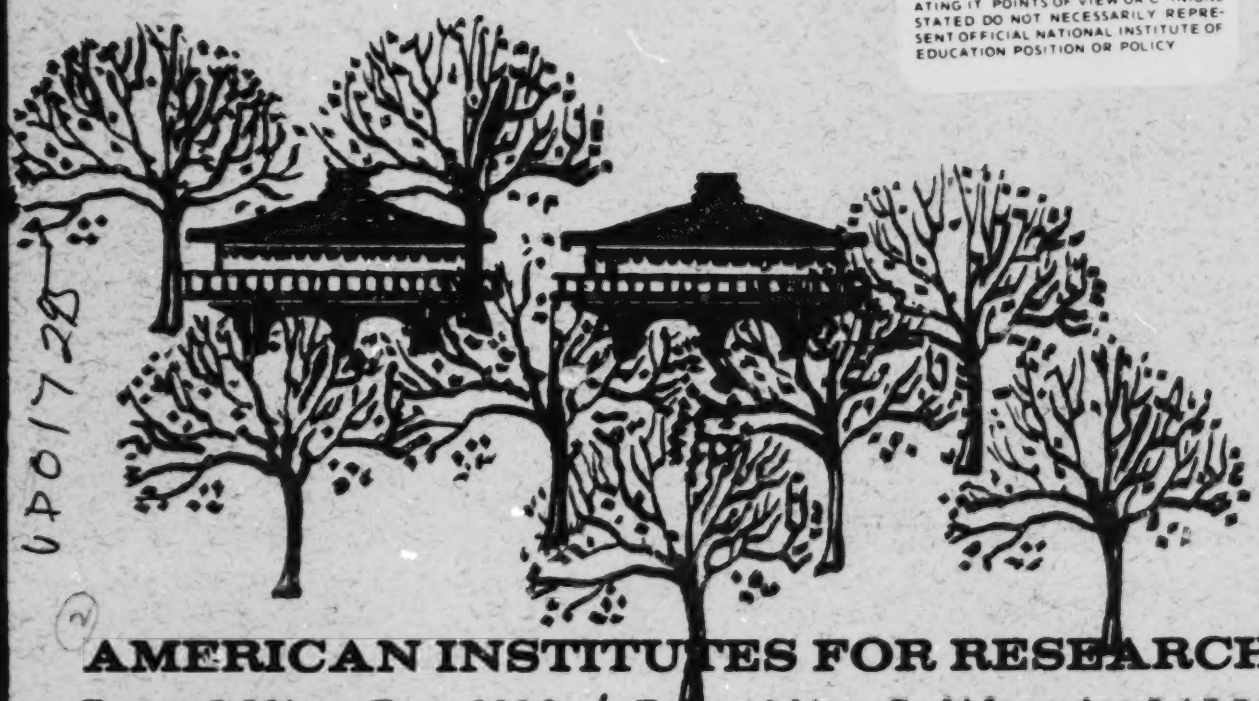

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This report is a product of contract #400-76-0129 between the National Institute of Education and the American Institutes for Research. Its content reflects the view of the individual author solely.

Preface

Title I of the Elementary and Secondary Education Act of 1965 has been in operation for slightly more than a decade. During that period, thousands of documents have been written about it, so an important step in deciding on the content of this synthesis was the choice of what small portion of the relevant literature to focus attention upon, within the temporal and budgetary constraints of this effort. The project monitor for the National Institute of Education, Alison Wolf, and the author jointly decided upon a set of fifteen major federal studies to be assimilated into this synthesis, along with other relevant sources that intruded into the author's consciousness. Those fifteen studies are described by Robert J. Rossi and his colleagues in a companion document. We believe that these documents contain much of what is known about compensatory education; however, this synthesis cannot substitute for a thorough review of the experimental research literature on educational disadvantage.

The initial draft of this synthesis was begun in May, 1977, after the fifteen major studies had been summarized and about a dozen methodological issues had been discussed in companion documents. Kevin Gilmartin, on the staff of the American Institutes for Research, made valuable comments and suggestions during the development of that draft. In early June, 1977, the draft was reviewed by Alison Wolf, Joy Frechtling, and Marjorie Kulash, of NIE, by George Mayeske, of the Office of Planning, Budgeting, and Evaluation in the U.S. Office of Education, and by Al Chalupsky, of AIR. Again, in producing the present draft, in July, 1977, Kevin Gilmartin has provided essential comments, along with editorial improvements.

Emily Campbell and Joan Hansen were very helpful in producing a final typed version of the manuscript that was not only more legible but also more understandable than what they were given. I am very grateful to them, to the reviewers, who made very useful comments, and to my wife, who gracefully accepted the implications of the temporal and budgetary constraints of this project. Of course, the responsibility for any errors in the final contents of this synthesis is mine alone.

Donald H. McLaughlin

TABLE OF CONTENTS

	Page
Preface	i
List of Tables and Figures	v
Introduction	1
Participant Selection	13
Treatment Delivery	37
Evaluation Reporting	49
Effectiveness	51
Overall Effectiveness	51
Variation in Effectiveness with Treatment	60
Variation in Effectiveness among Types of Participants	69
Major Problems	75
Summary	83
References	87

LIST OF TABLES AND FIGURES

Page

Table 1. Primary Information Sources by Topic 10
Table 2. Overall Level of Title I Participation and Funding 18
Table 3. Participation in Title I as a Function of Economic and Educational Disadvantage 20
Table 4. Relations between Education and Economic Disadvantaged and Compensatory Reading Participation, among 4th and 6th Graders, in 1972 22
Table 5. Per-Pupil Title I Expenditures, Related to Regular School District Expenditures and Pupil Participation 23
Table 6. Percentages of Title I Schools with Varying Concentrations of Educationally and Economically Disadvantaged Children . . . 24
Table 7. Percentage of Students in Title I Schools with Particular Critical Needs, 1968-69 26
Table 8. Number of Participants in Title I Activities in Four Ethnic Categories 27
Table 9. Percentages of Ethnic Groups in Different Disadvantage Categories, for 1967-68 and 1968-69 28
Table 10. Percentages of Ethnic Groups in the Lowest 30% of Reading Achievement and in Compensatory Reading Programs, Grades 2, 4, and 6, in 1972-73 29
Table 11. Percentage of Title I Participants in Different Ranges of Grade Levels 31
Table 12. Distribution of Participation in Title I by Size of District 32
Table 13. Title I Academic Program Participation Rate for Children in Different Community Types and with Different Levels of Disadvantage 33
Table 14. Percent Expenditures by Category and Year and Staff Numbers for the Title I Low Income Program 39
Table 15. Participation and Costs for Various Types of Compensatory Reading Activities, Grades 2, 4, and 6, 1972-73 46
Table 16. Percentage of Schools Using Various Agents for Compensatory Reading Assistance 46

List of Tables and Figures, continued

Page

Table 17. Evidence Concerning the General Effectiveness of Compensatory Education 54

Table 18. Methods Reported as Effective for Compensatory Education 65

Figure 1. Idealistic model for federal support of compensatory education 3

TITLE I, 1965-1975:

A SYNTHESIS OF THE FINDINGS OF FEDERAL STUDIES

Introduction

As a complement to its gathering of new information on the methods and effectiveness of compensatory education as mandated by Congress (P.L. 93-380, Section 821), the National Institute of Education contracted with the American Institutes for Research to produce a summary and synthesis of the substantive and methodological results of previous federal evaluations of compensatory education. This and two companion reports constitute that synthesis. The other two documents are Summaries of Federal Studies of Compensatory Education (Rossi, McLaughlin, Campbell, and Everett, 1977), containing a 5- to 10-page summary of each of 15 major studies, and Controversies in the Evaluation of Compensatory Education (McLaughlin, Gilmartin, and Rossi, 1977), containing discussions of ten major methodological issues. The aim of this document is to present the consensus of the major studies' results in terms of policy-related questions. At the outset of the task, it was expected that a major portion of the effort would involve the reconciliation of conflicting results of different but apparently valid studies; however, this turned out not to be a substantial problem. For most issues, the major problem was to draw any valid substantive conclusions from any of the studies. Nearly universally, the authors of the evaluation reports pointed out serious problems with their studies that limited their conclusions, and there were other problems not pointed out that could have been. These are discussed in the companion report on methodological issues. In spite of the methodological problems, this document is written for the reader who needs and is willing to settle for at least the partial answers to policy-related questions that can be obtained from the studies.

In order to select a reasonable format for presenting the many details learned about the federal compensatory education program through the evaluation studies, it is necessary first to consider the system referred to here as "Title I". Historically, the first major federal effort to provide aid to the elementary and secondary schools in the country was the Elementary and Secondary Education Act (ESEA) of 1965. Title I of that law, its major

component, authorized approximately $1 billion to be spent each year to meet the special educational needs of educationally disadvantaged children in low-income areas. Between 1965 and 1975, the authorization rose to an annual level of $4.4 billion, although appropriations rose only to $1.9 billion in that period. Title I was last amended in 1974 to produce incremental improvements in its operation; and consideration by Congress of major revisions is likely to precede its potential reauthorization in 1978.

The Title I system, if it can be called a system with its diffuse boundaries, is extremely complex and can best be understood by starting with a simple, idealistic image and showing how adaptations to problems have made it more complex. The idealistic model is presented in Figure 1. According to that model, through the joint efforts of parents, Congress, federal, state, and local school administrators, and teachers, educational disadvantage is "cured". Such a system can be deficient in many ways, however, and many potential deficiencies have, in fact, been demonstrated. Attempts to deal with these deficiencies have greatly complicated the system.

The only process in the model that has not been subject to question is the first, at the top of the spiral in Figure 1: it is clear that many children do not achieve cognitive skills at acceptable levels and that large numbers of children who are substantially behind the national norms are in poverty areas--the need is clear. The supposition that parents would be sensitive to this need and would effectively move Congress and local school administrators to action is questionable. Although poverty-related citizens' groups managed to get resources directed into the poverty communities through lobbying efforts, their ability to monitor the activities and effectiveness of the local school was questioned by Congress at the outset, and a provision was added to the law to ensure that each Title I project would be objectively evaluated once a year. Prior to 1970, examples of active parental involvement in Title I projects were rare (Gordon & Koutrelakos (1971) In 1970, Congress directed local and state education administrators to involve parents in compensatory education planning, a direction that USOE translated into guidelines for the formation of Parent Advisory Councils (PACs); however, despite the survey in 1973 by the National Advisory Council on the Education of Disadvantaged Children (NACEDC, 1974), which indicated that there is a great deal of parental involvement, there is no clear evidence

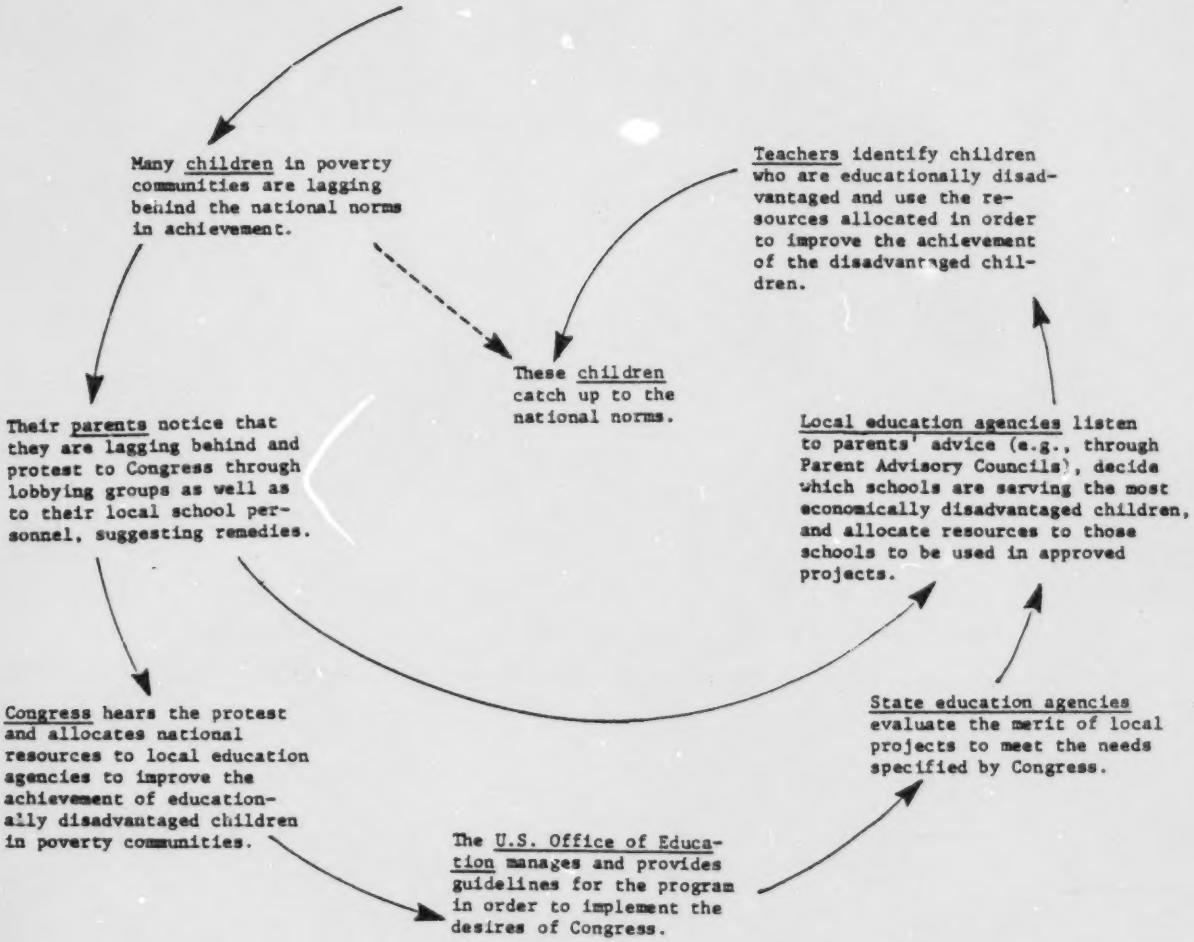
Many children in poverty communities are lagging behind the national norms in achievement.
Teachers identify children who are educationally disadvantaged and use the resources allocated in order to improve the achievement of the disadvantaged children.
These children catch up to the national norms.
Their parents notice that they are lagging behind and protest to Congress through lobbying groups as well as to their local school personnel, suggesting remedies.
Local education agencies listen to parents' advice (e.g., through Parent Advisory Councils), decide which schools are serving the most economically disadvantaged children, and allocate resources to those schools to be used in approved projects.
Congress hears the protest and allocates national resources to local education agencies to improve the achievement of educationally disadvantaged children in poverty communities.
State education agencies evaluate the merit of local projects to meet the needs specified by Congress.
The U.S. Office of Education manages and provides guidelines for the program in order to implement the desires of Congress.

Figure 1. Idealistic model for federal support of compensatory education

of the extent to which PACs have taken an active role in compensatory education planning.

Compensatory education became one of the major vehicles by which the "great society" was to be realized. The amount Congress authorized was far less than recommended levels, $10 billion to $50 billion annually (Gordon & Koutrelakos, 1971), to deal with the problem, however, and when the Vietnam war and later the recession of the mid-seventies decimated many great society programs, the appropriations increased at a snail's pace, falling behind the inflation rate for educational costs. In 1973, only 40% of eligible children were reported to be participating, because of limits on funds (NACEDC, 1974). Also, Congress did not specify what actions should be taken against districts that do not use the Title I funds strictly for the purpose of meeting the needs of disadvantaged children. This omission left program administrators with little support in efforts to ensure that Title I would work as effectively as possible. In 1965, Congress was apparently not aware of the immensity of the problem of developing and implementing a program to deal successfully with educational disadvantages on a national scope. Therefore, numerous problems occurred and were subsequently responded to through legislative amendments, revisions of regulations, and technical assistance from the U.S. Office of Education. By 1975, indications are that the program is more nearly operating in the manner Congress intended than earlier.

Especially in the early years of Title I, federal education administrators, primarily in the U.S. Office of Education, were understaffed to administer so large a program; regulations and guidelines were published sporadically and after much delay, and when they did appear, they were criticized as based on too little forethought. State and local administrators were frequently left with conflicting ideas of what they were called upon to do under Title I. The uncertain stature of the U.S. Office of Education (USOE) in its dealings with power groups, such as the Council of Chief State School Officers, along with problems stemming from competition among power groups within USOE, led to tentative and inconsistent leadership. Although these statements are strong indictments of the administration of Title I, they do reflect concerns expressed by Martin and McClure (1969), Wargo, Tallmadge, Michaels, Lipe, and Morris (1972), Briggs (1973), and Milbrey McLaughlin (1975). In summarizing evidence on Title I management in the period from 1965 to

to 1970, Wargo, et al. (1972), wrote:

> The Washington Research Project and several more recent studies of Title I management seem to agree that many of the administrative problems associated with the program have been or are due to (a) the size, uniqueness, and sudden enactment of the program, (b) a general failure at all management levels to accept administrative responsibility, (c) a state of local fear of domination by higher levels of authority, (d) negligence in enforcing regulations and lack of necessary leverage to do so, (e) uncertain and insufficient funding, and (f) over-concern with tracking the federal dollar.

By 1975, the frequency of administrative problems was greatly diminished as the program matured.

State education administrators have not been provided sufficient funds to carefully manage the use of Title I funds in local school districts in their states (about 1% of the total allocation goes to state administration); however, they have been charged with the responsibilities of approving local project descriptions and assembling yearly evaluation reports aggregating the results of local evaluations, in neither case with clear guidelines. In fact, state education administrators generally limited their role to ensuring that the local districts received all the Title I funds allotted to them while holding to a minimum the effort required of local districts to comply with federal regulations. GAO (1975) found that there was a need for state education agencies to establish monitoring systems to evaluate local performance meaningfully.

Local administrators were charged with the responsibility for selecting methods for transforming the financial aid into instructional and related resources likely to meet the special educational needs of educationally disadvantaged children in poverty areas in their districts. They were also charged with the responsibilities of (1) selecting as target schools those with the highest concentrations of needy children, (2) ensuring that Title I funds were used to supplement rather than replace the school's resources, and (3) conducting evaluations of Title I projects in their districts. They were to select representatives of parents of disadvantaged children to form Parent Advisory Councils to provide perspective in planning, carrying out, and evaluating Title I projects. Many instances of noncompliance were found by the HEW Audit Agency, especially in the first five years (Martin and

McClure, 1969). After the initial period, however, noncompliance has been greatly reduced, especially due to a greater understanding at all levels of the purposes and requirements of the program. A spot check of nine states by NACEDC (1974) showed that, while some expenditures were questioned in each state prior to 1970, expenditures in only one of the states were questioned in the period from 1970 to 1972.

In spite of all the managerial problems in the program, a great deal of money has been translated into compensatory education instructional resources, such as special classes or extra teaching aides. The crucial link in the system is between teacher and pupil: when the school provides compensatory instruction for its pupils needing such instruction, do these pupils benefit from the instruction? At first, it was expected that the answer would be affirmative, but as the early evaluations were performed, it became evident that the benefits would be difficult to demonstrate. Reactions to the lack of findings varied. First, attempts were made to find some methods that would work. Gordon and Koutrelakos (1971) analyzed the results of many studies of compensatory education in terms of methods found to be and not to be effective, and others searched for particularly successfuly projects. Results of the searches included the "It Works" series (Hawkridge, Chalupsky, and Roberts, 1968), the Project Information Packages (Tallmadge, 1974), the Follow-Through models (Rivlin and Timpane, 1974), and "Educational Programs that Work" (Far West Laboratory for Education Research and Development [FWLERD], 1976). Second, many people began to believe that compensatory education could not work. The very apparent need to help these deprived children, however, coupled with the impetus the program had built up in the first few years in terms of supplements to the budgets of schools serving low income areas, precluded halting the program. The discouraging evaluation results may, however, have slowed the expansion of Title I over the last few years. Finally, there was the reaction that the evaluations were badly done and therefore were not to be trusted. Indeed, those who carried out the national evaluations generally acknowledted the weakness of the data with which they worked, pointing out the need for more thorough studies while reporting what results they could infer.

There are three major tasks that the Title I system must accomplish:

(1) selection of participants, (2) delivery of compensatory education to participants, and (3) reporting of results as a means for improving the system. Congress and USOE have laid down general rules for achieving all of these, although the rules by themselves do not constitute a comprehensive guide for carrying out the tasks. USOE has provided an accumulating amount of technical assistance capability over the period of Title I operation. This has taken the form of formal regulations and guidelines in the case of participant selection, the form of dissemination of exemplary project models in the case of treatment delivery, and the form of detailed specification of evaluation models and the provision of regional evaluation technical assistance centers in the case or reporting results.

The first task, selection of participants, is accomplished in three stages. First, funds are allocated to local school districts (LEAs) on the basis of the number of children of low-income families residing in the districts. Over 90% of the nation's students reside in districts that receive Title I funds. Second, funds are allocated to schools within districts by local administrators. Regulations from the federal government specify that the funds are to be allocated to the schools serving the most economically disadvantaged children, and that except for Title I funds, the expenditures at Title I and non-Title I schools are to be nearly the same. The level of concentration of funds on a few or many schools in a district is at the discretion of the local administrators, although federal guidelines suggest that each participating student receive the benefit of at least a 50% increase in resources over nonparticipating students. The discrepancy between congressional authorization and congressional appropriation of funds, however, has meant that providing a 50% increase to some students necessitates limiting the number of participants to only some of the disadvantaged students. Third, selection of participants within schools is less formally specified than selection of schools, but the most educationally disadvantaged children (e.g., those who are more than one year below grade level in achievement) are supposed to be selected. Whether the allocated funds should be concentrated on a few very needy children in order to achieve large gains or should be spread across many disadvantaged children is a continuing controversy. Because evidence is lacking that Title I expenditures are correlated with project effectiveness, the case for

concentration is weak. In order to determine appropriate levels of concentration, it is necessary to establish "bench marks" consisting of specified curriculum packages whose costs and effectiveness are well known.

The second major task, delivery of compensatory education, is left by Congress to the local school administrators and teachers, and schools differ both in their specific objectives for compensatory education and their methods. The critical need for carrying out this task successfully is to provide teachers and local school administrators with information about compensatory education treatments that are effective. In order to help teachers select effective methods for meeting their compensatory education objectives, USOE published a series of descriptions of successful projects in 1969, it mounted a major effort (PIPs) to package the operations of successful programs in 1973, and it has established a national diffusion network to communicate descriptions of projects approved by its joint* dissemination review panel. Also, a comparison of the effectiveness of different methods has been included in every major federal study of the effectiveness of compensatory education. Thus, the federal role in this task has been one of support for developing and disseminating local efforts. Nevertheless, although many show potential, no methods have been developed into unqualified successes.

The third task, reporting of results in order to facilitate program improvement, was only vaguely recognized as a need at first. During the first five years of Title I, the main thrust of evaluation reporting was to provide information on the ways in which Title I funds might be purposefully or mistakenly misused, so that legislative and regulatory improvements could be properly made and technical assistance could be provided where most needed. As early as 1967, however, serious evaluative efforts were begun to determine whether Title I was effective and to identify the most effective compensatory education treatments. In nearly every case, such evaluations have been based on the data collected for the annual reports required by the law to be carried out in each district receiving Title I funds. This annual data collection effort was developed as a multistage process, with pupils' gain scores aggregated by teachers, whose reports were aggregated by local district administrators, whose reports were aggregated by state administrators, whose reports were aggregated by federal administrators into a report to Congress. Without precise guidelines, the evaluations and aggregations at each

* with NIE

level used different methods and units, rendering aggregations at each further level more tentative and less valid. As late as 1974 (Thomas and Pelavin, 1976), attempts to aggregate state reports were severely limited by the lack of uniformity of reports across states and the general lack of rigorous evaluation designs at the local level. In the 1974 amendments to Title I, Congress requested more usable evaluations. USOE commissioned the development of a few standard evaluation models (Horst, Tallmadge, and Wood, 1974) and established regional technical assistance centers to help state and local education agencies conduct usable evaluations.

The structure of this synthesis of the results of a decade of federal evaluations of compensatory education follows these three major tasks, participant selection, treatment delivery, and evaluation reporting. In addition, a section is included on effectiveness, as measured by student achievement gains; both average effectiveness and variation in effectiveness across participants and treatments are considered in that section. Also, a section is included that summarizes the problems that have confronted the Title I program, as set forth in the studies reviewed. Together, these sections cover the topics on which Gamel, Tallmadge, Wood, and Binkley (1975) found that federal policymakers needed information. "In essence, the major concerns expressed were centered on the necessity of knowing how Title I funds are spent, how target groups have been defined, how needs of the groups have been assessed, and if the treatments have resulted in significant educational gains" (Gamel et al., 1975, p.34). Methods used for needs assessment is one topic about which little has been reported.

The primary sources of information for the synthesis are shown in Table 1. These do not, of course, exhaust the literature relevant to these questions; however, they include the large majority of the sources of information reviewed in this study.

This synthesis is limited in four ways. First, it focuses on only a part of Title I, namely, the main program category of aid to local school districts serving low-income areas; and Title I itself is only one of several federal programs to meet special educational needs; and the report virtually ignores the numerous state and locally funded compensatory education programs.

Table 1

Primary Information Sources by Topic

Studies*	1 Participants	2 Treatments	3 Reporting	4 Overall Effectiveness	5 Effectiveness of Different Treatments	6 Effectiveness for Different Participants	7 Problems
1967-1968 Survey	•	•		•			
1968-1969 Survey	•	•		•			
CPIR 1970	•	•					
CPIR 1972	•	•					
CPIR 1973	•	•					
TEMPO				•		•	
Washington Research Project	•						•
Exploratory Study (McLaughlin)		•			•		
Literature Review (Gordon)		•			•		
It Works		•			•		
1965-1970 Synthesis (Wargo)	•	•	•	•	•		•
Planar Reports							•
State Reports Review (Gamel)	•	•	•	•			
State Reports Review (Thomas)			•	•		•	
Comp. Reading	•	•		•	•		
GAO 1975	•	•	•	•			•
PIPs Evaluation		•			•		

*See Rossi et al. (1977) for descriptions of these studies.

In addition to the main Title I system described here, there are other categories aimed at improving education for institutionalized delinquents and for children of migrant workers. That is not a severe restriction, however, because, in 1972-73 for example, the main, "low-income" program in Title I accounted for over 95% of Title I expenditures and for over 40% of all federal financial support for education.

Second, the synthesis is based on a small, albeit central, portion of the relevant literature. A search of ERIC for reports on "compensatory education" or "Title I" yielded 1,754 reports during the period 1966-1976. Although many of these reports were local evaluations, there were dozens of apparently relevant reports that could not be reviewed within the scope of this project. Furthermore, it has become apparent to the project staff that a deep familiarity with the literature on reading research (and research on other cognitive skills) is necessary for those who would seek to improve compensatory education. In particular, measures of achievement gain used in program evaluation will continue to be ambiguous until they are based on acceptable models of the growth process, perhaps building on the work of Carroll (1974) or Gibson (1970). A brief review of theories of the acquisition of reading ability was provided recently by Williams (1973).

Third, the scope of this study precluded reanalysis of the data collected in any of the studies reviewed. Although many of the data presented in those studies are transformed and recombined in this synthesis, evaluation of the validity of those data is primarily limited to noting the authors' disclaimers and applying general rules for evaluation of validity to the data collection and analysis operations described in the reports. Only in the case of the Compensatory Reading Study (Trismen, Waller, and Wilder, 1975), the largest and most promising of the studies reviewed, have more than superficial inquiries into the project's operations been made.

Fourth, and finally, the synthesis is limited to studies essentially completed by the end of 1976. Two major current efforts are not incorporated into the synthesis, and it is to be hoped that their results will fill many of the gaps of knowledge that exist. These two efforts are the Sustaining Effects Evaluation, which USOE, through the Office of Planning, Budgeting, and Evaluation, has contracted to have System Development Corporation

carry out, and the National Institute of Education's compensatory education assessment project, of which this synthesis is a small component. With regard to the NIE assessment project, the conclusions reached and criticisms made about evaluations of compensatory education in this document and its companions may or may not apply to empirical evaluations currently funded through NIE. The authors have operated essentially independently of the other components of the NIE study.

Participant Selection

The purpose of Title I is to provide services for a small segment of the American population, the 5 million school-aged children who live in low-income areas and who are judged to need compensatory education in order to bring their scholastic achievement up to the level typical of their age group. Participation of children in Title I programs is clearly an intermediate outcome of the system, not an ultimate outcome. In lieu of evidence of impact on achievement, however, this is the most logical criterion variable to substitute as an indicator of program impact. By reasoning that there is at least some positive effect of the program although not evident in test scores (e.g., reduced absences, less violence, better attitudes), the amount of that (unmeasured) effect would be proportional to the number of participants. Moreover, participation is a necessary concomitant to achievement as an impact measure: proper Title I impact is limited to achievement gains of disadvantaged children; a project which served other children and showed achievement gains would be misguided.

The primary question concerning participation is whether (1) substantial numbers of children falling within the specified category are not participating in Title I or (2) substantial numbers of other individuals are receiving aid through Title I, to the detriment of disadvantaged children. Because the rules for participant selection are based on a combination of economic and educational disadvantagement criteria, a subsidiary question of some importance concerns the strength of the relationship between economic disadvantage and educational disadvantage. To the extent that they are closely related, then allocation of resources according to either one or the other criterion is largely an academic question. If they are not related, a primary assumption of the program (that economic disadvantage leads

to educational disadvantage) is brought into question. A third question of importance in evaluation of the participant selection process concerns whether any identifiable segment of the population is receiving an amount of assistance not in proportion to their educational and economic disadvantage. Some segments of the population have greater needs and can be expected to be participating at greater rates; however, it is equally possible that some groups with needs are being overlooked. In order to verify the fairness of the allocation, it is necessary to examine the needs and rates of participation of different ethnic groups, different regions, different types of communities, and even different age groups.

In addition to general questions about participant selection, there are three specific problems that require particular attention.

1. Because funds are limited, a choice must be made concerning <u>how many</u> of a district's disadvantaged children are to be selected to participate. It is not clear whether it is better to concentrate funds on services for the most severely disadvantaged children or to spread funds to a larger set of children. Therefore, being able to identify different levels of concentration for different segments of the student population may be a crucial step in identifying the effects of concentration, if the population segments are found to benefit differentially from compensatory education. Although Tallmadge (1973) found virtually no correlation between per-pupil expenditures and effectiveness, nor did Flynn, Hass and Al-Salam (1976), Kiesling (1972) did find such evidence. Several sources have suggested that small-group or individualized instruction and instruction by specialists are components of successful compensatory education projects, and those types of instruction are costly.

2. Because Title I funds represent only a small portion of most schools' budgets, the relationship between Title I expenditures and other expenditures in the same district has been the focus of much attention. If, in fact, the funds are used for general instructional resources, designation of students who were participating within the district would be meaningless. In 1972, strict requirements were

set forth concerning this relationship. Basically, the concept of the requirements was that Title I funds should not supplant other funding sources, paying for services that would have been provided in any case, but rather that local and state expenditures for Title I schools must be demonstrably comparable to expenditures in non-Title I schools in the same district, so that Title I would provide supplementary services for disadvantaged children.

3. Because nearly 50% of the participants in Title I are black, and because segregation has been such a difficult problem for schools to deal with, care must be taken that strategies for compensatory education do not become strategies for segregation. Martin and McClure (1969) pointed out several ways in which this could occur; Wargo et al. (1972) noted that de facto segregation occurred in Title I schools; and Trismen et al. (1975) suggested an interpretation of their data as indicating that segregation might be occurring through assignment of blacks to "separate" classes. There appear to be no data available, however, to test the hypothesis that there is more (or less) interracial contact because of Title I.

There are three methodological probems to be dealt with in assessing participation in Title I. First, there is the problem of identifying participants. When Title I funds are used to employ a teacher aide in an elementary classroom, it is inefficient to set arbitrary rules about the extra time this allows for individual attention to particular "compensatory education participants". Although the teacher is likely to designate a few students as especially in need of attention, that does not imply that all children in the classroom will not benefit. In fact, the primary criterion in the initial study of Title I impact (the TEMPO study) was class mean achievement gain, not the gains of a selected set of "participants", as has later been the primary criterion for impact. The second problem is in the measurement of amount of participation of an individual. So far, no attempt has been made to identify an amount of participation by a pupil to be considered as a "full-time equivalent"; participants are counted the same for most analyses in most studies no matter how many hours of extra attention are targeted to their problems or how many hours they are actually

present for the instruction. Yet strong arguments have been made that exposure time to instruction is an important factor in achievement. A third problem, which has been dealt with in some cases, concerns the participation of a pupil in two or more Title I projects within a year. Although an argument can be made for counting each project and pupil combination as a participant, this makes impossible the analysis of percentage of participation--the number of participants would frequently be greater than the number of students in the school. Thus, interpretations of the number of participants reported in a survey should be made cautiously. In attempting to present as much information as possible in this section, we have made simplifying assumptions, such as that all participants can be counted equally.

There are two primary sources of data relating to these general questtions and several ancillary sources relating to more specific questions. The primary sources are (1) the national surveys of the 1967-68 and 1968-69 school years (summarized by Wargo et al., 1972) and (2) the CPIR surveys of 1969-70, 1971-72, and 1972-73, by the National Center for Educational Statistics (NCES, 1971, 1975, 1976). Some state reports have provided supplementary, corroborating, and contradictory evidence, as presented by Briggs (1973) and Gamel et al. (1975). The Compensatory Reading Study (Trismen et al. 1975), although its sample was not strictly representative, produced data relevant to the relational questions. Finally, the annual reports of the National Advisory Council on the Education of Disadvantaged Children to the President and Congress contain some relevant information.

The surveys of 1967-68 and 1968-69 and the Compensatory Reading Study were limited in focusing on three elementary grades (specifically, grades 2, 4, and 6). Thus, they do not pertain to the total compensatory education program of many districts. The NCES surveys tend to treat questions of participant characteristics and of students' needs superficially,* presumably because of their need to minimize the response burden on local school administrators. The NCES surveys are most helpful in obtaining global estimates of the scope of program operations (Title I is merely three of the fifteen different federal program categories covered in the CPIR).

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* For example, economic disadvantage has been indicated only by the fact that the child attends a school designated as eligible for Title I assistance.

The small number of State Title I Annual Evaluation Reports that have provided aggregatable data on participants severely limits the utility of these reports to assess participation at the national level. According to Gamel et al. (1975), they "are neither sufficient nor consistent enough to form a nationally representative picture of Title I expenditures" (p. 88).

Overall participation. As shown in Table 2, the number of children participating in Title I programs first increased and then decreased. The expenditure per pupil has apparently risen over the years, although the supporting data are not clearly valid. The comparison of per pupil expenditures across years based on different reports is particularly tentative because it is not clear which different categories of expenditures may have been included in the total expenditures in different years (e.g., state administrative costs, institutionalized program funds, and Parts B and C) nor what counts of students were used for the ratio. The only source we reviewed that contained expenditures for the whole decade was the 1975 Annual Report of the Office of Planning, Budgeting, and Evaluation in the U.S. Office of Education. Also shown in Table 2 is the estimated population of school-aged children in areas served by Title I eligible schools and of all school-aged children. The large number of children in Title I schools reported by NCES during the 1971-72 school year is unexplained: its deviation from figures for 1969-70 and 1972-73 is far beyond the levels of random statistical error reported for the survey. Although the questionnaire varied slightly from year to year, there is no obvious explanation in terms of change of definition. If other errors of this magnitude (we assume the true figure for 1971-72 was no more than 20 million) are present in the survey, it dampens the confidence that can be placed in conclusions based on the NCES CPIR survey, at least for the 1971-72 school year.

The most important generalization represented in the figures in Table 2 concerns the size of the program: although it is large, it sill only represents 20%-30% of the educational costs for only 10%-20% of the nation's pupils--i.e. about 3% of all school expenditures.

Later, we shall refer to results from the Compensatory Reading Study (CRS) (Trismen et al. 1975) concerning participation. Although the results of that study (in particular, of Phase 2 of that study, which assessed student characteristics) were not intended to be quantitatively representative

Table 2

Overall Level of Title I Participation and Funding

	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75
Participants (in millions)	8.3[a]	9.0[a]	10.5[a]	7.9[a]	7.4[a], 7.1[b]		5.9[b]	5.6[b]		
Title I School Population (in millions)					19.8[b]		24.6[b]	18.2[b]		
Total School[f] Population (in millions)		43.1[c]		45.0[c]	45.7[b] 45.6[c]	45.9[c]	45.9[b]	45.4[b] 45.8[c]	45.1[c]	44.8[c]
Title I Expenditures (in billions of dollars)	.97[a] .96[e]	.98[a] 1.04[e]	1.07[a] 1.14[e]	1.00[a] 1.05[e]	1.09[a] 1.27[e]	1.42[e]	1.30[b] 1.52[e]	1.23[b] 1.71[e] 1.39[g]	1.62[e] 1.45[g]	1.76[e] 1.59[g]
Title I Expenditures per participant (in dollars)	117[a]	108[a]	102[a]	127[a] 164[d]	147[a] 184[d]	219[d]	243[d] 220[b]	276[d] 231[b]	291[d]	
Total Expenditures by Elementary and Secondary Schools (in billions of dollars)	31[c]	34[c]	37[c]	40[c]	44[c]	48[c]	54[c]	58[c]	64[c]	69[c]

[a] Wargo et al. (1972), based on information supplied by USOE.

[b] NCES CPIR survey reports.

[c] The Condition of Education, vol. 3 (1977).

[d] Gamel et al. (1975), unweighted mean of about 25 state reports per year, only 13 reports for 1973-74.

[e] USOE Evaluation Report (1976), appropriations, not including migrant and neglected or delinquent children's programs, rather than expenditures.

[f] Includes public schools only, pre-K through 12th grade.

[g] NACEDC reports (1973, 1974, 1975, 1976). Expenditures in Part A for LEAs' programs for low-income areas.

sample, and it provides the only relevant data for some questions concerning participation. Although the CRS oversampled schools not providing compensatory reading instruction, that should not affect conclusions about, for example, the relative participation of girls and of boys in compensatory reading activities.

Participation and economic and educational disadvantage. The surveys of 1967-68 and 1968-69 identified six categories of relative need and estimated the proportions of children in each category. These proportions are shown in Table 3, along with the proportions of each category of students who were served by Title I. Although these data rely on teachers' subjective estimates, pertain to the situation of 3 and 9 years ago, and should not be taken as indicative of the situation in 1977, there are several important points to be noted from them that might be investigated in future studies (no comparable data are available later than 1968-79). The points are: (1) only 40% of economically disadvantaged children (categories I, II, IV, and V) were in Title I schools; (2) about 1 in 4 educationally disadvantaged children (categories I, II, and III) in Title I schools received more than 100 hours of compensatory basic skills instruction in 1968-69, but so did about 1 in 10 children who were not educationally disadvantaged; (3) the intensity (more than 100 hours) of compensatory basic skills instruction was greatest for severely economically disadvantaged children (about 80% of participants received more than 100 hours--Column H divided by Column G) and least for non-economically disadvantaged children (about 55%), although logic would call for differentiation of intensity on the basis of educational disadvantage; and (4) per-pupil Title I expenditures were not related to economic or educational disadvantagement levels. Note that these problems in participation may be either in assignment of individual students within classrooms or in selection of program emphasis at a higher administrative level (e.g., district or state). The fact that errors in assignment of Title I funds and activities for pupils may have accurred indicate a need for a similar study of participation by categories of need in 1977 to evaluate policy changes in the formula for allocation of finds and selection of children.

In 1972, the Educational Testing Service collected somewhat relevant data, focusing on compensatory reading programs rather than all of compensatory education, in the Compensatory Reading Study (USOE, 1976b). That study

Table 3

Participation in Title I as a Function of Economic and Educational Disadvantage

Disadvantagment Category	A: Percent of all school-aged children (1967-68)	B: Percent of all children in Title I schools (1967-68)	C: Proportion of children in category who attended Title I schools (1967-68)	D: Proportion of those in Title I schools receiving compensatory academic instruction (1967-68)	E: Title I expenditures per participating pupil (1967-68)	F: Percent of children in Title I schools (1968-69)	G: Proportion of those in Title I schools receiving compensatory basic skills instruction (1968-69)	H: Proportion of those in Title I schools receiving more than 100 hours of basic skills instruction (1968-69)	I: Proportion of those in Title I schools receiving cultural enrichment (1968-69)
I. Under $3000 annual family income and less than high school ability	4%	7%	39%	51%	$156	6%	38%	30%	6%
II. Between $3000 and $6000 annual family income and less than high school ability	5%	9%	36%	49%	$162	9%	39%	23%	5%
III. Above $6000 annual family income and less than high school ability	5%	4%	13%	41%	$166	4%	34%	18%	4%
IV. Under $3000 annual family income and at least high school ability	6%	10%	39%	47%	$156	8%	26%	20%	13%
V. Between $3000 and $6000 annual family income and at least high school ability	15%	27%	36%	39%	$166	29%	20%	13%	9%
VI. No serious economic or educational disadvantage	65%	44%	13%	25%	$164	44%	11%	6%	9%
	100%	100%				100%			

Notes: The percentages in columns C, D, G, H, and I are of those in the particular disadvantagement category. Therefore, they need not sum to 100. Columns B, F, G, H, and I are based on grades 2, 4, and 6. Column A is based on an analysis of census data.

Estimates by teachers provided the basis for classification of whether a child possessed the abilities necessary to complete high school and for classification of family income. All data are derived from the USOE surveys of compensatory education during 1967-68 and 1968-69.

was especially important in that it compared compensatory reading programs at schools that did not receive Title I funds with those that did.* The notion some may have that Title I is the main source of funds for compensatory education can be dispelled by examining the numbers in Table 4: for example, 35% of students in non-Title I schools were receiving such assistance, compared to 45% of students in Title I schools. A surprisingly large percentage of children in grades 4 and 6 were a year or more below grade level in reading. Of those who were a year or more below grade level, only about two in three received compensatory reading assistance, even in schools with Title I funds, while one in four of the other children also received such assistance. Before concluding that compensatory efforts were being misallocated, however, the reader should remember (1) that achievement tests are not perfectly reliable and possibly not as valid as careful teacher judgments of need for compensatory instruction and (2) that the classification of a particular child as a "participant" in compensatory reading was also a teacher judgment, and although it was a straightforward judgment whenever children were pulled out of class for special instruction, children receiving in-class treatments are more difficult to identify.

A particularly distressing problem of funding allocation pointed out in the survey of the 1967-68 school year was the dilution of per-pupil Title I expenditures in just those districts where pupils would need it most. The results are reproduced in Table 5. As stated in the report of that survey (USOE, 1970), "the poor child in a low expenditure district finds himself disadvantaged in at least four ways: (1) he and his family are poor; (2) his school is poor: (3) his school district receives proportionately fewer Title I dollars with which to provide special services; and (4) he receives a smaller share of those fewer Title I dollars" (p. 10).

The relation between economic and educational disadvantage is an important rationale for the Title I funding formula. Data in Tables 4 and 6, from the Compensatory Reading Study and 1968-69 USOE survey (Glass, 1970) respectively, indicate a strong relationship. Thus, allocation according to economic disadvantage does assure that a large number of educationally disadvantaged pupils will be served. Finally before turning to factors other

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* The results quoted that are based on the Compensatory Reading Study may be somewhat biased in that they represent schools that indicated their willingness to participate in the study earlier than others.

Table 4

Relations between Educational and Economic Disadvantaged and Compensatory Reading Participation, among 4th and 6th Graders, in 1972

	Title I Schools	Non-Title I Schools*
Percentage of students receiving compensatory reading instruction	45%	35%
Reading National Percentile Ranks of compensatory reading participants	21%	24%
Reading National Percentile Ranks of other students	46%	53%
Percent of students how were one or more years below grade level in grades 4 and 6 (i.e., educationally disadvantaged)*	51%	37%
Percent of educationally disadvantaged children who receive compensatory reading assistance	64%	60%
Percent of noneducationally disadvantaged children who receive compensatory reading assistance	25%	20%
Percent of Free Lunch participants who are educationally disadvantaged	63%	44%
Percent of Free Lunch nonparticipants who are educationally disadvantaged	38%	33%
Percent of Free Lunch participants who receive compensatory reading assistance	55%	38%
Percent of educationally disadvantaged Free Lunch participants who receive compensatory reading assistance	69%	60%

Source: The Compensatory Reading Study (USOE, 1976b).

*Term used for this table only; not used in original.

Table 5

Per-Pupil Title I Expenditures, Related to
Regular School District Expenditures and Pupil Participation

Regular Per-Pupil Expenditures	Percent of Pupils Who Participate in Title I Programs					
	0-25	26-50	51-75	76-100	Total	Average Percent of Participation
Less than $425	$225	$158	$158	$66	$108	68%
$425-$625	$241	$160	$171	$83	$174	39%
Greater than $625	$282	$152	$268	$107	$226	47%
Total	$243	$158	$200	$70	$142	44%

NOTE: Data from the USOE survey of compensatory education during 1967-68.

Table 6

Percentages of Title I Schools with Varying
Concentrations of Educationally and Economically Disadvantaged Children

Concentration of Economically Disadvantaged Pupils**	Concentration of Educationally Disadvantaged Pupils*			Total*** Percentage of Schools
	Low (Less than 3 in 10)	Medium (Between 3 in 10 and 7 in 10)	High (More than 7 in 10)	
None	3%	1%	0%	5%
Some, but less than 1 in 4	31%	38%	9%	78%
More than 1 in 4	2%	7%	7%	17%
Total Percentage*** of Schools	36%	47%	16%	100%

*Expressed as proportion of the school's pupils who were one or more years below grade level in reading.

**Expressed as proportion of the school's pupils whose families were on welfare.

***Totals may differ from sums, due to round-off error.

Note: Data from the 1968-1969 survey (Glass, 1970).

than economic and educational disadvantage, we can see from another table based on the 1968-69 survey (Glass, 1970), Table 7, that compensatory reading, language, and math instruction were the most prevalent critical needs noted by teachers, and all the needs were more frequent among pupils with severe economic disadvantage (categories I and IV in Table 3).

Participation by ethnic groups. The number of participants in Title I programs from four ethnic categories is shown as Table 8. The evidence suggests the tentative conclusions that (1) more whites than blacks participated in Title I activities; (2) blacks and Spanish-surnamed children have participated in far greater percentages than they are represented in the total population of the country; (3) the overselection of ethnic minorities has been both in the selection of districts and in selection of students for compensatory academic instruction within districts; and (4) the focus on ethnic minorities did not change between 1968 and 1972.

The reason for overselection and overparticipation of ethnic minorities is clearly their greater need for compensatory education. Figures in Table 9, from 1967-68 and 1968-69, show that they have serious disadvantages of both economic and educational types more frequently than whites. Percentages of disadvantaged students who actually participated in Title I academic programs during 1967-68 did not vary greatly between blacks and whites. However, a larger proportion of the most seriously disadvantaged Sparish-surnamed children participated than of their white and black counterparts; and among blacks, there was very poor discrimination of need levels in selection for participation.

Corroborative data on ethnic differential economic needs were collected by Root and Cata (1970) (reported in Wargo et al., 1972). During 1969-70, 39% of black school-aged children were members of families that were "below the poverty line", compared to 10% of whites.

Corroborative data on ethnic differential educational needs and participation were provided in the Compensatory Reading Study (Trismen et al., 1975) as shown in Table 10. Apparently, general participation in academic compensatory education programs has not been based on ethnic group membership, other than because of its correlation with need. Trismen et al. (1975) suggested, however, that the type of program methodology might vary between ethnic groups. They found that among blacks and Spanish-surnamed students

Table 7

Percentage of Students in Title I Schools with Particular Critical Needs, 1968-69

Critical Need	Percentage with Need	
	All Pupils	Pupils with Severe Economic Disadvantage
Reading	43%	67%
Language	37%	64%
Math	37%	59%
Cultural enrichment	27%	45%
Health	11%	28%
Psychological counseling	10%	14%
Food	6%	27%
Special education	5%	11%
None	34%	9%

Note: Data from the 1968-69 survey (Glass, 1970).

Table 8

Number of Participants in Title I Activities in Four Ethnic Categories

	Ethnic Category			
	Black	White	Spanish-Surnamed	Other
Number of Public School Students, 1968-69, grades preK-12	6,282,173 (14%)	34,697,133 (80%)	2,002,776 (5%)	371,486 (1%)
Number in Title I School Districts, 1967-68, grades 2, 4, 6	1,399,209 (22%)	4,480,232 (72%)	393,755 (6%)	
Number in Title I School Districts, 1968-69, grades 2, 4, 6	1,299,114 (23%)	3,999,597 (71%)	370,432 (6%)	
Number of Participants in Special Title I Programs, 1968-69, grades 2, 4, 6	439,939 (30%)	899,668 (61%)	131,238 (9%)	
Number Receiving More Than 100 Hours of Title I Academic Instruction, 1968-69, grades 2, 4, 6	270,809 (38%)	361,298 (51%)	77,515 (11%)	
Estimated percentages of Compensatory Reading Participants in grades 2, 4, 6 in 1972-73	26%	62%	10%	2%

Notes: 1967-68 and 1968-69 data were based on the national surveys and therefore include only 2nd, 4th, and 6th graders. 1972-73 data were based on the Compensatory Reading Study. Percentages are relative to row totals. "Whites" refers to non-Spanish surnamed whites. The different terminology "special programs," "activities," and "participants," between 1968-69 and 1974-75 makes comparison of the figures risky.

Table 9

Percentages of Ethnic Groups in Different Disadvantage Categories, for 1967-68 and 1968-69

Categories of Disadvantage		Blacks		Whites		Spanish-Surnamed and Other	
		1967-68	1968-69	1967-68	1968-69	1967-68	1968-69
I.	Under $3000 annual family income and less than high school ability	16 (52)*	13	3 (52)	3	12 (64)	9
II.	Between $3000 and $6000 annual family income and less than high school ability	12 (44)	13	7 (51)	7	15 (62)	15
III.	Above $6000 annual family income and less than high school ability	2 (45)	2	3 (40)	4	3 (47)	2
IV.	Under $3000 annual family income and at least high school ability	26 (53)	21	5 (45)	3	15 (50)	12
V.	Between $3000 and $6000 annual family income and at least high school ability	31 (46)	36	25 (37)	26	37 (47)	40
VI.	No serious economic or educational disadvantage	12 (40)	14	56 (23)	57	18 (40)	21
		100	100	100	100	100	100

*Numbers in parentheses are the percentage of those with needs who actually participated in Title I academic programs.

Note: Estimates by teachers provided the basis for classification of whether a child possessed the abilities necessary to complete high school and for classification of family income. Data are from the USOE surveys of compensatory education during 1967-68 and 1968-69.

Table 10

Percentages of Ethnic Groups in the Lowest 30% of Reading Achievement and in Compensatory Reading Programs, Grades 2, 4, and 6, in 1972-73

	Blacks	Whites	Spanish-Surnamed
Percentage in Lowest 30% of the Population in Reading Achievement	65%	21%	60%
Percentage Receiving Compensatory Reading Instruction	69%	33%	70%

NOTE: Data are from the qualitatively representative sample selected for the Compensatory Reading Study (Trismen et al, 1975).

there was a greater tendency for compensatory and noncompensatory reading instruction to be carried on in separate classrooms than for whites.* Trismen et al., (1975) inferred from this that "such student assignments are being made at least in part on the basis of ethnicity, apart from reading level" (p.75). Although that conclusion might be partially true, it does not follow from the data analyses they reported. A reanlysis of their data within those schools in which compensatory and regular reading students are separated, searching for instances of misassignment in order to achieve ethnic homogeneity (or ethnic heterogeneity) of the instructional environment, is called for.

Participation by grade level. As shown in Table 11, the emphasis so far has been on the early grades, and that emphasis increased between 1968 and 1974. Where conflicts among data sources exist, the figures from the national surveys by NCES are probably more accurate than the figures based on subsets of state reports (Wargo et al., 1972; Gamel et al., 1975) because those state reports were not weighted to remove bias when aggregating. The increasing number of Title I participants in the early grades contrasts with the decrease in the percentage of the total population in those grades: from 1969-70 to 1972-73, the percentage of the nation's pupils who were in prekindergarten through third grade declines from 30.5% to 28.5%.

Participation by size and location of school district. According to the NCES surveys of 1971-73, as shown in the left-hand columns of the body of Table 12, Title I participants tended to be in smaller districts. This result is misleading, however, because it ignores base rate expectations: in fact, overall, more children were in the smaller districts, and it was among children in the largest school districts that the participation rate was greatest!

The 1967-68 survey collected information on needs and participation in different types of communities. Based on those results, the data in Table 13 indicate that generally the same proportion of children with severe needs participated in all community types other than suburbs, where more of the children with severe needs were missed; however, there tended to be greater participation by the nondisadvantaged in larger cities.

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* It is not clear from their report whether this tendency was a within-school phenomenon or a between-school or even a between-region phenomenon.

Table 11

Percentage of Title I Participants in Different Ranges of Grade Levels

Grade Level	School Year					
	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74
Pre-K - 3	39[a],37[d]	43[a],40[d],38[c]	42[d],46[b]	43[d],52[b]	45[d],50[b],43[c]	47[b]
	(38)*	(40)	(44)	(47)	(45)	(47)
4 - 6	29[a]	30[a],28[c]	29[b]	30[b]	33[b],29[c]	33[b]
	(29)	(29)	(29)	(30)	(30)	(33)
7 - 9	22[a],21[d]	19[a],19[d],22[c]	18[d],15[b]	17[d],13[b]	16[d],13[b],20[c]	13[b]
	(22)	(20)	(17)	(15)	(17)	(13)
10 - 12	10[a]	9[a],11[c]	7[b]	4[b]	4[b],8[c]	4[b]
	(10)	(10)	(7)	(4)	(7)	(4)

Note: In some cases, data were presented for larger spans (pre-K-6 and 7-12), and these cases have been divided proportionally based on the proportions from other sources. Thus the figures in this table are slightly more regular than the true figures.

*Figures in parentheses are best estimates, which are weighted averages based on subjective judgments of the representativeness of the data from the several sources.

Sources: [a]Wargo et al. (1972); [b]Gamel et al. (1975); [c]NCES surveys; [d]Larson and Dittmann (1976).

Table 12

Distribution of Participation in Title I by Size of District

District Enrollment	Percent of all Title I Participants*			Participation Rate in Title I**	
	1971-72	1972-73		1971-72	1972-73
125,000 ≤	16%	17%		21%	21%
35,000 - 125,000	15%	12%		17%	13%
9,000 - 35,000	19%	22%		11%	12%
3,000 - 9,000	24%	24%		14%	12%
300 - 3,000	26%	25%		16%	16%
TOTAL:	100%	100%	MEAN:	15%	14%

*Ratio of the number of Title I participants in districts of the particular size to the total number of Title I participants in all districts.

**Ratio of the number of Title I participants in districts of the particular size to the total number of pupils in districts of the particular size.

Note: Data based on CPIR surveys (NCES, 1975, 1976).

A significantly smaller percentage of the disadvantaged students in suburbs were participating than in other communities, probably due to their schools' not being sufficiently impoverished to qualify for Title I funds. On the other hand, it might be argued that these particular students are not the targets for Title I, because they are attending relatively affluent schools: Title I is designed to aid schools in low-income areas that are financially incapable of supporting adequate compensatory services for their educationally disadvantaged pupils, not to aid children in low-income families directly. A fundamental redirection of Title I funds to compensate for the special educational needs arising from economic disadvantage in a child's family would shift more funds to suburban school areas, according to these results.

Participation by region. In the NCES survey for 1972-73, participation was reported for four regions of the country. Of children in the North Atlantic states and in the West and Southwest states, 14% participated in Title I; in the North Central states, 11% of the children participated; however, in the Southeastern states, 21% of the children participated. In 1972-73, the Title I expenditures per participant were highest in the North Atlantic states, about $300, and dropped off to $240, $230, and $215 in the North Central, Southeast, and West and Southwest, respectively.

There was a significant interaction between region and school district size in the Title I participation rating.* In the North Atlantic and Central regions, participation rate was especially high in the largest districts, but in the Southeast, participation rate was especially high in small districts.

Other correlates of participation. The staff of the Compensatory Reading Study estimated the correlations of a large number of variables with participation in compensatory reading (Trismen et al., 1975). Although the overall participation rates in that study were higher than the national average, the relations of participation to other variables are not clearly biased. Among their most interesting results are the following:

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* The total enrollments in the five strata of district size (see Table 12), in millions of pupils, were for the North Atlantic: 2.2, 0.5, 2.5, 3.6, and 2.3; for the North Central: 1.1, 1.2, 2.7, 3.3, 4.2; for the Southeast: 0.5, 2.4, 2.8, 2.9, 1.3; and for the West and Southwest: 1.4, 1.9, 3.8, 2.2, and 2.2. Participation rate is the ratio of participants to total enrollment.

1. Boys tended to participate more frequently than girls (45% vs 35%), and although no pretest comparisons between the sexes were reported, other research suggests that this corresponds to a slightly lower average reading achievement among boys than among girls.

2. The average age of compensatory reading participants was slightly higher than their grade-mates, suggesting that 5%, 17%, and 22% of 2nd, 4th, and 6th graders, respectively, in compensatory reading had already been held back a year in school.

3. Among 4th and 6th graders in compensatory reading, 70% had had prior compensatory reading experience, and 25% of the 4th graders and 30% of the 6th graders in compensatory reading had had three or more years of compensatory participation.

Summary. Not all children with educational and economic disadvantages have participated in Title I programs. Although there are not recent data to related participation to needs, roughly half the children with severe needs were being served in 1968. Among blacks and in the large city school districts, there was poor discrimination between those with and without needs in the selection of children to participate, or else teachers' judgments of needs in those groups were poor. Results of the Compensatory Reading Study also indicated a substantial overlap, in 1972-73, between compensatory and regular reading pupils on standardized reading achievement tests. On the other hand, there is no question that Title I participants tended to be educationally and economically disadvantaged; and the conclusion that some children with greater needs were not served while others with lesser needs were served must be viewed with extreme caution because of the fallible measures of educational and economic need.

There is no evidence that selection for compensatory education participation was being made on any grounds other than educational of economic disadvantage: all other observed correlates of participation were equally likely to be correlates of need. One minor exception to this was the emphasis on participation of children at early ages; this exception is minor in that it does not in the long run exclude any individuals from participation.

Finally, results based on the Compensatory Reading Study (USOE, 1976b) indicate that, in 1972-73, about 70% of the third of the children in Title I

funded schools who were both one or more years below grade level and participants in a free lunch program received compensatory reading assistance; however, a sixth of the children in non-Title I funded schools also had the same needs, and 60% of them received compensatory reading assistance. Thus, it is clear that Title I is but one of several sources, formal or informal, of support for compensatory reading assistance.

Treatment Delivery

Local school districts are given the responsibility, under Title I, of selecting strategies for using the allocated funds as they deem best for meeting the special educational needs of educationally disadvantaged children in poverty areas. They may, on the basis of needs assessment, choose to focus on a single objective, such as improving reading achievement, or to attack a broader range of objectives. For the selected objectives, they may choose to implement any of a variety of treatments, such as buying curriculum packages, hiring a reading specialist, or hiring teaching aides. In order to describe the range of activities succinctly, we shall use two methods: first, a presentation of expenditures in terms of the formal categories used in various surveys and reports (Wargo et al., 1972; Gamel et al., 1975; NCES, 1975, 1976); and second, a series of 40 very brief descriptions of exemplary projects described in reports of the It Works series (Hawkridge et al., 1968, 1969; Wargo et al., 1971). The results of the surveys serve to convey the relative frequencies of treatments delivered across the country; however, they lack the detail to provide us with an idea of what Title I treatments actually consist of. The very brief project descriptions, on the other hand, at least begin to give an idea of what a Title I treatment looks like. The list of descriptions can not be interpreted as quantitatively representative of the country, however, because the projects were selected as exemplary and they were selected by informal sampling procedures.

Formal Categories

There are three distinct reasons for attempting to report the categories of resources for which Title I funds have been used, even though

there is no conclusive evidence about the relative effectiveness of different treatment methods. First, there is the need to know whether the funds are being used to meet defined problems. For example, in view of the problem that many young people leave school without mastering the basic skills of reading, writing, and mathematics, it is important to know what percentage of funds have been used for instruction in these basic skills. Second, there is the need to know what emphases have been in the past in order to decide on policies of changing allocation strategies. If nearly all funds were already being spent on basic skills instruction, it would be meaningless to propose allocating a larger percentage to basic skills instruction. Third, the act of obtaining and reporting this information serves a management function of communicating to the local decisionmakers the need to account for the expenditure of public funds.

The allocation of funds by category for the years from 1965-66 to 1973-74 are shown in Table 14. After the initial year (1965-66) in which funds were appropriated two months prior to the end of the school year, the percentage of expenditures that were designated directly for instruction has been fairly stable at about 70% (disregarding the 1973-74 results in the RMC report, because they are based on only 5 state reports). There has been a steady decrease in expenditures for construction and equipment over the years, and the emphases in noninstructional pupil services have changed from health and food to counseling. So-called "fixed charges" have risen steadily from 5% to 8%. These include, for example, "retirement, insurance, rent, and interest on current and short-term loans" (NCES, 1976, p. 105).

Approximately 60% of the instructional expenditures have been for the teaching of English language arts, including reading. Another 15% has been spent for mathematics and natural science. The remaining 25% was spent on combinations of subject matter that were categorized differently in different reports. The dramatic increase in expenditures for mathematics instruction reported by RMC for 1973-74 is a function of the small sample size and, in particular, the fact that Mississippi allocated 37% of its Title I instructional bunds to mathematics that year.

Breaking the expenditures down in other ways, it appears that from 1971-72 through 1973-74 about 85% of the funds were spent on programs during the school year and 15% on programs during the summer. As pointed out in

Table 14

Percent Expenditures by Category and Year
and Staff Numbers for the Title I Low Income Program

Percentages	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74
Instruction - Total	52[a]	66[a]	69[a]	72[a]	73[a]	69[c]	61[c],62[b]	80[c],67[b]	81[c]
(English Language Arts)	32[a]	41[a]	40[a]			38[c]	32[c],41[b]	46[c],44[b]	48[c]
(Math & Natural Science)	7[a]	7[a]	7[a]			7[c]	8[c], 9[b]	10[c],11[b]	19[c]
(Cultural Activities)	7[a]	8[a]	3[a]			2[c]	2[c], 3[b]	1[c], 2[b]	0[c]
Other Services - Total	8[a]	10[a]	10[a]	10[a]	10[a]	11[c]	14[c],15[b]	7[c],12[b]	5[c]
(Food)	2[a]	3[a]	3[a]	3[a]	3[a]	3[c]	2[c], 1[b]	1[c], 1[b]	0[c]
(Counseling)							3[b]	3[b]	
Administration	3[a]	5[a]	5[a]	5[a]	5[a]	6[c]	10[c],10[b]	5[c],10[b]	5[c]
Construction & Equipment	33[a]	13[a]	9[a]	5[a]	4[a]	5[c]	2[c], 2[b]	2[c], 1[b]	2[c]
Fixed Charges	3[a]	5[a]	5[a]	6[a]	6[a]	7[c]	11[c], 7[b]	5[c], 8[b]	7[c]
Other	1[a]	1[a]	2[a]	2[a]	2[a]	2[c]	2[c], 4[b]	1[c], 2[b]	1[c]
Percentage for Regular Term						68[c]	85[c]	86[c]	86[c]
Percentage for Summer Term						32[c]	15[c]	14[c]	14[c]
Number of Professional Staff in Regular Term (in thousands)							160[b]	152[b]	
Number of Nonprofessional Staff in Regular Term (in thousands)							123[b]	117[b]	
Number of Professional Staff in Summer Term (in thousands)							84[b]	58[b]	
Number of Nonprofessional Staff in Summer Term (in thousands)							53[b]	31[b]	

Data sources: [a]Wargo et al., 1972
[b]NCES CPIR surveys
[c]Gamel et al., 1975

the Compensatory Reading Study (Al-Salam & Flynn, 1976), the costs per participant-hour tend to be larger for summer programs. In terms of the agents of instruction, about an equal number of teachers and teacher aides were supported by Title I funds during the regular school term, but a smaller proportion of teacher aides were used during the summer, at least in 1971-72 and 1972-73. Although there is no information available on the relative cost-effectiveness of employing additional teachers versus teacher aides for compensatory education, Hiatt (1977) has reported (1) that teachers who have aides working with them are generally more satisfied with their jobs, but (2) that teachers tend to deploy teacher aides to tasks that do not maximize the teaching effectiveness of the team. She suggested that teachers be instructed in the proper use of teacher aides as part of their training.

In order to understand the nature of the Title I contribution to education, it would be useful to compare the data in Table 14 to the amounts spent from other sources for various categories of resources. However, these data appear to be available only for federal programs. Using the NCES report for the 1972-73 school year, one finds that the Title I "low-income" program accounted for 41% of federal aid to local education agencies that year. The categories in which the Title I expenditures were relatively much higher than other federal programs were English language arts (44% of Title I expenditures vs. 7% of other expenditures), other basic skills (22% vs. 9%), the pupil support services of nonvocational guidance, health, attendance, and transportation (5% vs. 2%), and fixed charges (7.6% vs. 2.4%). The functional categories toward which other federal programs were substantially more targeted than Title I included food (42% vs. 0.6%), vocational skills and guidance (13% vs. 0.7%), student subsidies (1.9% vs. 0.1%), non-textbook materials (4.6% vs. 1.5%), and construction and equipment (4.1% vs 1.4%). Thus, the functional profile of Title I expenditures, with its focus on basic skills instruction, is substantially different from that for other federal aid to local education agencies.

Project Descriptions

In order to supplement the information provided by the categorization of Title I expenditures, we have included a set of descriptions of exemplary

compensatory education projects. The projects or models described were developed from a variety of funding sources and with a variety of objectives. They have in common that at one time or another they have shown evidence of success, although no methods have proven to be unequivocal successes. There are no data on the relative frequency of projects like the ones described.

The descriptions are based primarily on those given by the authors of the It Works series summaries. Insofar as possible, we have included (1) the site and originator of each project; (2) its level of structure and orientation; (3) its student:teacher ratio; (4) the primary operational objectives of the project; (5) the target age-group; and (6) the intensity and length of the child's participation. We hope that this set of descriptions will provide readers with a basis for interpreting the meaning of abstract terms such as "participation rate" and "compensatory reading assistance". The list is ordered approximately in terms of increasing age of the target group.

1. Infant Education Research Project (Washington, D.C.) (Schaefer): an unstructured tutoring program for 1 hour per day in the child's home. Targets were children between the ages of 15 and 36 months. Toys, games, books, and verbal stimulation were used to stabalize and improve IQ test scores.

2. Mother-Child Home Program (Freeport, New York) (Levenstein): a moderately structured program in which a "Toy Demonstrator" promoted verbal interaction between mothers and their 2-3 year old children during 2 half-hour sessions per week for a year. Aim was to improve IQ test performance.

3. Perry Preschool Project (Ypsilanti, Michigan) (Weikart): an unstructured activity center (plus a 90-minute home visit once a week) using "verbal bombardment" in highly structured thematic units for 15 hours per week over 2 years with functionally retarded 3- and 4-year olds. Aim was to improve performance on IQ tests and reading, language, and math achievement tests. Used 4 specialized teachers with 24 children. This is related to the Cognitive Curriculum Follow-Through model.

4. Preschool Program (Fresno, California) (Forrester): a program using teacher aides and parents (student;teaching personnel ratio 4:1) to improve the language abilities of 3- to 5-year olds, primarily from Spanish-speaking families, during 3-hour daily sessions. Used typical preschool materials.

5. Preschool Program (Oakland, California) (Waters): a program using a team consisting of a teacher, a teacher aide, and a parent with each 15 children of ages 3 to 4, four hours daily for a year, in teacher-directed small-group activities with individualized learning unit series emphasizing language skills, in order to improve IQ test performance. Included many enrichment activities and field trips.

6. Academic Preschool (Champaign, Illinois) (Bereiter and Engelmann): a highly structured, teacher-directed (student:teacher ratio of 5:1) two-hour-per-day program aimed to improve the readiness of 4- and 5-year olds who were retarded in reading, language, or math. This is related to the Direct Instruction Follow-Through model.

7. Ameliorative Preschool Program (Champaign, Illinois) (Karnes): a highly structured, teacher-directed (student;teacher ratio 5:1) program in which 2 hours per day were spent in preschool, then 1 hour per day in kindergarten. Aim was to improve readiness of 4-year-olds in reading, language, and math. A special game format was used.

8. Diagnostically Based Curriculum (Bloomington, Indiana) (Spicker): a teacher-directed (student:teacher ratio 15:1) behavior modification program using diagnosis of problems in language, concepts, and fine motor development in a year-long, 4-hour-per-day program with 5-year-olds to improve IQ and language performance. Activities were similar to a regular kindergarten.

9. Learning to Learn Program (Jacksonville, Florida) (Sprigle): a mainly child-directed set of activities for 3 hours per day for 5-year-olds, using toys, games, and books in a structured sequence to guarantee successes for all children. The aim was improvement of IQ test performance. Short (15 minute) small-group (student:teacher ratio 3:1), teacher-directed sessions were interspersed in each session.

10. Project Breakthrough (Chicago, Illinois) (Tracy): a combination of highly structured "Edison Responsive Environment" sessions of 1-1/2 hours daily, including "Talking Typewriters", and intensified social services for welfare parents, aimed at improving the performance of 4- to 5-year-olds on IQ and readiness tests. Used a Laboratory Supervisor in a varying ratio (1:1 to 10:1) with children. This is related to the Responsive Environment Follow-Through Model.

11. Project Early Push (Buffalo, New York) (District staff): a low-structured, child-directed program of activities, four hours daily for a year, using typical preschool practices to improve the performance of 4-year-olds on readiness tests. Used a visiting teacher, home-school coordinator, and teacher aides with a student:teaching personnel ratio of 15:1.

12. PS 115 Alpha One Reading Program (New York, N.Y.) (Reiss): a moderately structured, game-oriented program, two hours daily for first graders, aimed at improving reading skills. Based on a commercial self-contained kit of lesson plans and materials to be used by the regular teacher.

13. Language Stimulation Program (Auburn, Alabama) (Carter): a highly structured language improvement program, four hours per week for ten weeks, for first graders, using the Peabody Language Development Kit instead of regular language instruction.

14. Programmed Tutorial Reading Project (Indianapolis, Indiana) (Ellson): a highly structured reading improvement program, one half-hour daily for first graders, in which heavily supervised paraprofessional tutors followed a tightly programmed sequence of "lesson plans" in one-to-one tutorial sessions. This became one of the 6 original PIPs.

15. Speech and Language Development Program (Milwaukee, Wisconsin) (District staff): experienced speech therapists worked with groups of 6 to 8 first- and second-graders with low oral language facility, three hours per week for 15 weeks, in order to improve verbal language skill.

16. Early Childhood Project (New York, N.Y.) (Deutsch): a moderately structured program emphasizing self-paced, individualized, and small-group instruction with much feedback and with creative dramatics, for five hours per week over five years from prekindergarten to third grade. Aimed to improve language and concept skills, then math and science skills. Used a college-graduate assistant teachers with a regular teacher in each class.

17. Malabar Reading Program for Mexican-American Children (Los Angeles, California) (Oaxaca): a low-structured program of self-directed activities emphasizing oral and written language aimed at improving reading and language performance over a five-year period from prekindergarten to third grade. Used parent volunteers to reduce student: teaching personnel ratio below 30:1.

18. Augmented Reading Project (Pomona, California) (District staff): a combination remedial reading and community activation program for children in grades one through six, mostly from Spanish-speaking families. Counselors, psychologists, remedial reading specialists, a "helping teacher", and teacher aides were employed to assist the regular teacher.

19. More Effective Schools (New York, N.Y.) (Fox): a major reorganization of teaching of elementary school students, emphasizing language skills and reading, heterogeneous student grouping, moderate student-teacher ratio (15:1 to 22:1), remedial, tutorial, and enrichment instruction, and encouragement of teachers to use innovative techniques; aimed to improve reading achievement.

20. Project Conquest (East St. Louis) (Spann): teachers received up to a year of special training in methods of diagnosis and treatment of reading problems. Afterwards, pupils in grades 1 through 6 with reading problems were identified and assigned to clinics or "other classrooms" for 1-1/2 to 3 hours per week for small-group (student: teacher ratio 6:1) instruction by reading teachers using a variety of materials. This became one of the 6 original PIPs.

21. Project MARS (Dominster, Massachusetts) (Ellis): pupils in grades 1 through 4 who were diagnosed as having reading problems received 3/4 hour of remedial instruction daily from reading specialists (student: teacher ratio 6:1) using a variety of materials. Aim was to reduce the discrepancy between their ability and performance in reading.

22. Self-Directive Dramatization Project (Joliet, Illinois) (Carlton and Moore): pupils in grades 1 to 4 worked in an unstructured small group and dramatized stories they read portraying self-chosen characters, 3 to 5 times per week for 7 months, in order to improve reading achievement.

23. Project Concern (Hartford, Connecticut) (Paradise): pupils from largely black inner-city elementary schools were bused to suburban white schools where they entered classes in small numbers. They were accompanied by a teacher and an aide who assisted the regular staff of the suburban school in order to improve the IQ, readiness and achievement performance of the bused children through their regular teaching methods.

24. School and Home Program (Flint, Michigan) (Smith): teachers assigned home reading exercises and provided guides to parents on how to support their children's learning, every evening for five months, for elementary school students, in order to improve reading achievement.

25. After School Study Centers (New York, N.Y.) (District staff): pupils in grades 2 through 6 volunteered for up to 2 hours daily remedial reading instruction between 3 and 5 p.m., in which teachers tutored students individually or in small groups using the SRA Reading Labs and other materials aimed to improve reading achievement.

26. Intensive Reading Instructional Teams (Hartford, Connecticut) (District staff): pupils from grades 3 through 6 with reading problems spent 3 hours daily for 20 weeks in a structured program using a variety of strategies to increase reading achievement. A reading specialist worked with two reading teachers and focused on three areas: decoding, basal reading, and individual motivation. This became one of the 6 original PIPs.

27. Homework Helper Program (New York, N.Y.) (Deering): in this program, needy but able high school students were paid to tutor failing pupils in grades 3 through 6, 2 to 4 hours per week after school for 5 months, in order to improve reading achievement. Both pupils and tutors gained significantly.

28. Afternoon Remedial and Enrichment Program (Buffalo, New York) (District staff) and Plus Program (Buffalo, New York) (District staff): two remedial reading and mathematics programs for pupils in grades 3 through 8 (1 through 8 for Plus Program), in which regular teachers taught 1-1/2 hour sessions after school daily (extra teachers taught 1-1/2 hour sessions during the school day in the Plus Program), with a 6:1 pupil:teacher ratio.

29. Fernald School Remediation of Learning Disorders Program (Los Angeles, California) (Feshbach): pupils in grades 2 through 8 of average intelligence but lagging achievement were bused to a laboratory school for 6 hours of daily instruction for one year. Highly structured, broad-based, individualized instruction by specially trained teachers (student:teacher ratio of 5:1) was designed to improve reading, language, and math achievement.

30. Diagnostic Reading Clinics (Cleveland, Ohio) (Davis): pupils in grades 4 through 7 below expected reading level but not with "low IQs were given an individual 1-hour-per-day highly structured remedial reading session with a reading specialist, speech therapist, psychologist, social worker, or aide, lasting 3 to 5 months, in order to improve reading achievement.

31. Elementary Reading Centers (Milwaukee, Wisconsin) (District staff): reading centers with specially trained reading teachers were provided in schools so that pupils in grades 4 through 8 with reading problems could receive small group (student:teacher ratio 6:1) instruction one-half hour daily to deal with their individual problems.

32. Lafayette Bilingual Center (Chicago, Illinois) (Picchiotti): pupils in grades 6 through 8, who as recent immigrants spoke Spanish, were initially taught in Spanish, with a gradual transition to English over a period of 1 to 3 years. Anglo pupils learned Spanish and participated as models and tutors.

33. Communication Skills Center Project (Detroit, Michigan) (Thomas): pupils in grades 2 through 11 were diagnosed for reading problems and given individual or small-group instruction at clinics or in special classrooms, about 2 hours per week (1 hour daily in summer sessions), by special reading teachers aided by psychologist, social therapists, and lay aides.

34. Remedial Reading Laboratories (El Paso, Texas) (Steirnagel): pupils in grades 4 through 12 diagnosed by counselors as having reading problems were given highly structured individualized instruction, one hour daily for 8 months, by lab teachers, half of whom were credentialed reading specialists.

35. Higher Horizons 100 (Hartford, Connecticut) (White): 100 ninth graders entering high school more than a year behind in reading were invited to enter a year-long "school within a school" in which intensive language training was included in all subjects 4 hours daily. A counselor worked full time with these 100 students.

36. Project R-3 (San Jose, California) (District staff): eighth and ninth graders who were 1 to 2 years behind in reading or math were given structured instruction emphasizing "readiness, relevance, and reinforcement", during 3 morning class periods for a year. Real-world problems were included in the curriculum, and structured field trips were taken. This became one of the 6 original PIPs.

37. Summer Junior High Schools (New York, N.Y.) (Fox): pupils in grades 7 through 9 who were behind in reading or who had failed a course were given highly structured instruction, 1-1/2 hours daily for 4 weeks during the summer. Teacher aides used by the program were high school graduates from impoverished communities who were in need of financial assistance to continue their education.

38. College Bound Program (New York, N.Y.) (Hillson): pupils in grades 9 and 10 with good attendance but somewhat lower than average achievement (on the average) were motivated to pursue a college prep curriculum and provided with intensive individualized summer instruction, 3 hours daily for 6 weeks, to assist them in realizing this goal. Local colleges were persuaded to commit themselves to accepting and providing financial aid to a percentage of the participants.

39. Expanded Language Arts Program (Buffalo, N.Y.) (Heintz): extra teachers were hired to reduce the pupil:teacher ratio to 10:1 in language arts classes, 1 class per day, in grades 7 through 12. Teachers were heavily supervised, and audiovisual materials were used extensively.

40. Summer Upward Bound (Terre Haute, Indiana) (District staff): high school students with college potential spent all day daily for 8 weeks in each of 3 summers on a college campus, in a highly structured innovative program of academic and extracurricular activities designed to increase their aspirations for and likelihood of success in a college education. College students were used as tutors.

Models for projects discussed at length by M. McLaughlin (1971) were Research for Better Schools, Inc., which produced IPI, a carefully sequenced program of individually prescribed instruction designed for general student use but used in many Title I schools; and the Demonstration and Research Center in Early Education (DARCEE) in Nashville, Tennessee, which developed projects emphasizing the involvement of parents in the teaching of their children.

The Compensatory Reading Study (Trismen et al., 1975) recorded several variations of methods of administering compensatory reading instruction, some of which are shown in Tables 15 and 16. The Compensatory Reading Study also categorized overall reading programs into 11 clusters based on combinations of attributes. However, they did not report which of the clusters were more frequently aimed at compensatory target groups of children. On the other hand, the program characteristics closely related to Title I vs. other funding sources were use of audiovisual equipment and emphasis on basic reading activities.

There are, of course, other sources of exemplary project descriptions. Over 200 one-page descriptions of "Education Programs That Work" have been published by the U.S. Office of Education (FWLERD, 1976). Also, the NACEDC has included exemplary project descriptions in each of their annual reports to Congress.

Summary

The lack of centralization of design of methods in the Title I system has accomplished the goal of covering a wide range of activities to be tried. The treatments can be characterized as particular combinations of functions, agents, subjects, environments, and activities.

Functions: increasing cognitive abilities, increasing the rate of achievement, improving the self/ideal image, and improving attitudes toward school work.

Agents: (regular) teachers, teaching aides, parents, paraprofessional tutors, peer tutors, peer models, reading specialists, speech therapists, counselors, social workers, and computers.

Subjects: primarily reading, language arts, and mathematics, but also natural science, social studies, cultural enrichment, and other non-basic skill areas.

Table 15

Participation and Costs for Various Types of Compensatory Reading Activities, Grades 2, 4, and 6, 1972-73

Method	Average Class Size	Percent of Children in Sample	Cost per Pupil
In separate classrooms	26	23%	$148
In mixed classrooms (with regular reading pupils)	27	20%	$152
In small, special reading groups (separate)	8	2%	$664
In small, special reading groups (mixed)	12	2%	$580

Note: Data from the Compensatory Reading Study National Sample of 226 schools (USOE, 1976).

Table 16

Percentage of Schools Using Various Agents for Compensatory Reading Assistance

	Schools with Title I Funded Comp. Reading Only	Schools with Title I and other Funded Comp. Reading	Schools with non-Title I Funded Comp. Reading Only
Use of volunteers in the compensatory reading classroom	45%	48%	54%
Use of pupils as tutors	53%	32%	40%

Note: Data from the Compensatory Reading Study (Rubin et al., 1973).

Environments: (regular) classroom, "laboratory", library, special classroom, home, field trips, college campus; child centered, structured, open, small groups, and individual interactions.

Activities: (regular) lessons, kits of special lessons, audiovisual experiences, games and toys, dramatics, paying children to learn, parent training, busing, tutoring, and counseling.

Other pupil services, such as health, food, and clothing, have accounted for a small and decreasing percentage of the Title I effort. Finally, about 1.3% of Title I expenditures have been for the purpose of preservice and in-service training, which has included the large majority of teachers and teaching aides providing compensatory education.

Although the methods have varied, the primary focuses of Title I projects have been on directly improving the reading and other language skills of children in the primary grades. This focus has increased over the decade of Title I operation.

Evaluation Reporting

Annual evaluation reports are required in Title I. These evaluation reports were intended from the beginning to provide continuing checks that the funds were being used to help children (M.McLaughlin, 1975). An important component of the evaluations has been the measurement of the improvement of children's performance as a function of participation in compensatory education programs. National summary evaluations (USOE, 1970; Glass, 1970; Wargo et al., 1972; Planar, 1973; Gamel et al., 1975; GAO, 1975; and Thomas and Pelavin, 1976) have been based on aggregations of these local evaluation reports. The information needs that the reports of evaluations might serve are discussed in a companion document (McLaughlin, Gilmartin, and Rossi, 1977).

The unanimous opinion of those who attempted to aggregate the reports to present a national picture is that evaluation reporting has been far less than adequately implemented. We have discussed in the companion document many specific problems in evaluation and will not repeat them here.

In the case of the national surveys of local school districts in 1967-68 and 1968-69, only about 7% of the sampled districts provided usable data on program effectiveness. In their analyses of state reports, Wargo et al. (1972) found that out of the 91 reports for 1969 and 1970 (combined) only 24 reported achievement data that were "possibly representative of their state," and only 7 of these presented data in such a way that they could be combined across states. Without common guidelines, states had developed many creative ways of presenting their results, and only the presentation of average grade-equivalent gains occurred frequently enough to warrant aggregation. That, it has been pointed out by a number of authors, is unfortunate because of the distortions that can occur in interpreting

grade-equivalent gains.* In its analysis of 26 state reports for 1972, the Planar Corporation (1973) found 14 of the reports to provide presentable data. In a major study of the evaluation reporting system, Gamel et al. (1975) analyzed achievement data from 187 state reports for the period from 1971 to 1974. Only 64 of these were evaluated as either representative or only "possibly biased." Of these, 27 reported reading achievement gains that were sufficiently similar to warrant combining the results; average monthly gains were reported, however, in only 16 of the reports. As in Wargo's analysis, Gamel et al. (1975) found grade-equivalent gains to be the only frequently used metric. An important conclusion that Gamel et al. (1975) reached was that state reports had not improved over the period from 1971 to 1974. Thomas and Pelavin (1976) extended the previous analyses by considering how conclusions might be changed if different criteria of "data adequacy" were used. Starting with 283 reports, they compared an initial sample of acceptable reports, essentially the same as Wargo's and Gamel's, with (1) an extended sample including about 5 extra state reports per year from which inferences could be made, (2) a high-quality sample limited to about half of the reports is the initial sample that were judged to be most likely to be representative, and (3) a longitudinal sample of states with adequate data for all four of the years 1971 through 1974. They found that results were essentially the same using any of the samples.

In response to the difficulties that had been pointed out in using the local and state evaluation reports to construct a national picture of Title I effectiveness, the Congress included in the Education Amendments of 1974 a request for improvement; subsequently, USOE contracted with RMC Research Corporation to produce several standard evaluation models that would be feasible for local school districts to implement. USOE also contracted with educational research organizations across the country to provide ten regional technical assistance centers to help improve evaluations and specifically to help implement the RMC-produced evaluation models. In 1977, these models are in the process of being adopted in many states and may be expected to improve the ability to aggregate local evaluations into a national evaluation of Title I effectiveness.

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*A grade-equivalent score is the grade level for which the score is typical (e.g., 4.5 means typical of a student in the fifth month of fourth grade). A grade-equivalent gain is expressed in terms of grade-equivalent months gained per month in school or grade-equivalent years gained per school year.

Effectiveness

Overall Effectiveness

In its FY75 annual evaluation report, the U.S. Office of Education stated that "the evidence is now mixed whereas in prior times the only evidence available indicated that disadvantaged students had not improved or fell further behind" (USOE, 1976a, p. 94). Behind this rather weak statement of positive program effects lies the content of tens of thousands of pages of reports by reputable evaluators over a ten-year span. Some reports have indeed indicated the existence of positive effects and others negative, and nearly every report has ackowledged the existence of severe problems in acquiring interpretable data sufficient to answer the question.

The measurement of effectiveness of Title I has in almost every case involved scores on ability and achievement tests taken by participating children. This, in addition to the identification that the appropriate children are participating (discussed earlier), is the essential outcome sought by the program. Whatever the other effects of Title I are, they are, according to the law, of secondary importance to the goal of helping children (in low-income areas) having difficulty with school to do better in school. There have been frequent arguments that achievement tests are sensitive to only a subset of the ways in which children can do better in school, omitting such factors as improved attendance, not dropping out, greater interest in scholastic pursuits, and improved self-image. However, there appears to be a general consensus that these factors are more important as means to the end of improving cognitive achievement. Generally, the results of studies that have measured both affective and cognitive impact have produced ambiguous results: In Project LONGSTEP (Coles et al., 1976) and the Follow-Through Planned Variations Study (Anderson, 1977), affective and cognitive gains appeared to be positively related, but in the Compensatory Reading

Study (Trismen et al., 1975), attitude and achievement scores tended to be negatively correlated (+.13, -.49, and -.46 in grades 2, 4, and 6, respectively). Other sources of relevant data are discussed in a companion volume (McLaughlin, Gilmartin, and Rossi, 1977).

In a broader context in which one considers the motivations of the many designers and supporters of the original legislation and the program's continued operation, direct impact on children's performance in school may be only one of several forms of impact of Title I. That law and program also serve to (1) redistribute the resources of society generally to the people most in need, (2) add to the total income of poverty areas, in the form of teaching aide employment, (3) provide further federal leverage to achieve national goals such as equality of opportunity for all ethnic groups, (4) focus a larger percentage of society's resources into education, and (5) focus the research and development activities of the education sector on particular problem areas. None of the studies reviewed has clearly addressed any of these goals, and it is beyond the scope of this study to investigate them, however important they are.

Various studies have used various measures of achievement gain. Except for the Compensatory Reading Study and the PIPs evaluation, all the studies reviewed relied on whatever test happened to have been selected by the local district in order to measure achievement. Although the Anchor Test Study (Loret, Bianchini, and Vale, 1974) produced tables relating eight major test series in 1975, the problem of aggregating gains across districts remains complicated, because no standardized test measures exactly the skills taught in any particular classroom. In order to solve this problem in the long run, it will probably be necessary to complicate evaluation further by allowing each teacher or school to use the most appropriate test it can find or construct, and then to compare <u>both</u> the extent to which children gain on that test <u>and</u> the differences in measured objectives between teachers. Such comparisons can only be meaningful in terms of an acceptable global taxonomy of eductional objectives.

One particular question about the definition of impact concerns the decision by USOE to focus its evaluative resources on the particular skill area of reading. It could reasonably be argued that compensatory education is likely to be more effective in some subjects than in others. For example,

preliminary results from the impact evaluation of ESEA Title VII (the Bilingual Program) (American Institutes for Research, 1977) found it to be effective in mathematics but not in language arts. However, there is a general consensus that the ability to read is the single most important cognitive skill that schools in our society are responsible for imparting, and as long as there are many children who are only marginally learning to read, it seems reasonable to evaluate the overall impact of Title I in terms of its effects on reading achievement. The focus on a single subject area for evaluation was dictated by the need for an intensive investigation of an area narrower than all of Title I in order to produce interpretable impact data.

Nine studies that have to some extent addressed this question are listed in Table 17. The conclusion reached in each is presented, along with a description of the data base and a listing of the most severe problems preventing acceptance of the conclusion. The most dramatic aspect of the information presented in Table 17 is that no studies have been completed that provide an unequivocal answer to the question of how much effect Title I has had on achievement. Thus the situation is not one in which there are some valid studies that found positive results and some that found negative results. There is no starting point of a single study with a definitive answer. That does not imply, however, that the studies have nothing valid to say about the general level of success of compensatory education programs.

In this situation, a proper strategy is to list possible answers to the question and evaluate which are more likely to be true. In the area of reading achievement, the following are seven possible answers.

1. At the end of a year's compensatory instruction, most students are performing at levels superior to other children of their age.
2. At the end of a year's compensatory instruction, most students are performing at levels typical for children of their age.
3. Students in compensatory programs tend to be closer to their peers in achievement at the end of the instruction than at the beginning.
4. Students in compensatory programs tend to be about as far behind their peers at the end of instruction as at the beginning.

Table 17

Evidence Concerning the General Effectiveness of Compensatory Education

Study	Measure of Success	Conclusion	Validity*	Most Serious Defects**
TEMPO	School reading testing in 1966-67 vs. in 1965-66 (whole classes)	Decline except in bottom decile	Clearly invalid	Small, unrepresentative sample; invalid criterion (comparison with previous year without correction); did not identify participating children
1968 USOE survey	Achievement in gains per month	Less than 1.0 month per month	Probably invalid	Fewer than 10% of districts responded with adequate achievement data
1969 USOE survey	Achievement in gains per month and teachers' reports of improvement	Less than 1.0 month per month, but teachers reported positive gains	Probably invalid	Fewer than 10% of districts responded with adequate achievement data; questionable validity of teacher judgments
Planar examination of state reports	Achievement in gains per month relative to norms (1972)	About 1.0 month per month	Clearly invalid	State reports have unknown biases; small number of adequate reports; aggregation in terms of grade-equivalent scores relative to published norms
AIR examination of state reports	Achievement in gains per month relative to norms (1969-70)	Between 0.7 and 1.4 month per month	Probably invalid	State reports have unknown biases; small number of adequate reports; aggregation in terms of grade-equivalent scores relative to published norms
RMC examination of state reports	Achievement in gains per month relative to norms (1969-74)	As great or greater than 1.0 month per month	Probably invalid	State reports have unknown biases; small number of adequate reports; aggregation in terms of grade-equivalent scores relative to published norms
SRI examination of state reports	Achievement in gains per month relative to norms (1969-74)	As great or greater than 1.0 month per month	Probably invalid	State reports have unknown biases; small number of adequate reports; aggregation in terms of grade-equivalent scores relative to published norms
1975 GAO report	Achievement in gains per month relative to norms (1974-75)	Less than 1.0 month per month	Clearly invalid	Small, unrepresentative sample; aggregation in terms of uncorrected months gained; comparison to published norms in terms of grade equivalents
Compensatory Reading Study	Reading test scores, comparison between compensatory and noncompensatory groups, posttest corrected for pretest	No substantial or significant difference	Questionable internal validity	Inadequate statistical analysis of the data (model for pretest-posttest relations, treatment of problems with class means)

*The author's subjective evaluation. The reader may set different overall standards, but would probably agree, upon seeing the reports, (1) that the TEMPO study, the Planar study, and the 1975 GAO study have the weakest data bases and most questionable analyses and (2) that the CRS has greater validity than any of the other studies.

**These defects were nearly always noted by the authors of the respective reports. They are <u>not</u> the only serious defects in the studies, but are the most serious in this author's opinion.

5. Students in compensatory programs tend to fall behind other students, but not as fast as if they had received no compensatory instructions.

6. Students in compensatory programs tend to fall behind other students at the same rate they would without compensatory instruction.

7. Students in compensatory programs tend to fall behind other students faster than they would without compensatory instruction.

No studies that were reviewed provided data that would support the first, second, or seventh conclusions. The fourth alternative answer has the greatest support, in the form of the Compensatory Reading Study's findings of no substantial differences between compensatory and noncompensatory groups (Trismen et al., 1975). The analysis of Annual State Reports by SRI suggests that the third alternative answer may be plausible; on the other hand, the USOE surveys for the 1967-68 and 1968-69 school years, the AIR reanalysis and synthesis (Wargo et al., 1972), and the 1975 GAO report tend to indicate the fifth or sixth alternative. Between 1965 and 1976, expectations have changed from the second of the seven levels of success to the fifth. If students are shown to fall back not as fast as would be predicted by their pretest percentile level, then the project is viewed as effective.

One is tempted to compare the validity of studies that had alternative findings in some quantitative way to arrive at a conclusion based on "the preponderance of evidence". However, that procedure would be based on a confusion between "validity" and "reliability" of results. The reliability of a study is the extent to which replications of the study (e.g., on a different sample of students) would produce the same results. The validity of a study is the extent to which generalizations based on the data are true. In general internal validity refers to validity with respect to statements about the sample studied; external validity refers to validity with respect to generalizations to a larger population. Of two valid studies, one based on a sample of 10 school districts and another based on a sample of 100 school districts, one would correctly select the conclusion of the latter study in case of conflict, because of the greater "reliability" of its results--i.e., the smaller likelihood that the results would be different if a different sample of the same size had been selected. Validity, on the other hand, is a quality of a study that is not easily quantifiable; each cited study is subject to a particular set of threats to validity, and the results are not, therefore, strictly comparable. In order to reach a conclusion, therefore, we attempt

to determine the extent to which various threats to each study's validity are likely to have distorted the results.

The single cited study with the greatest opportunity to achieve valid conclusions was the Compensatory Reading Study. In that study, data collection was under the control of the evaluator, whereas all other studies relied on data collected for other purposes (i.e., annual local evaluations) without clear evidence of quality control. In the Compensatory Reading Study, compensatory reading instructional effectiveness was evaluated by comparing pretest to posttest changes in standardized reading achievement tests (MAT, STEP) between students receiving compensatory reading (CR) instruction and those not receiving compensatory reading instruction (NCR). Five different analytical methods were employed (USOE, 1976b); however, all suffered from the various faults that arise when the students receiving one treatment are different from those receiving the other treatment: effects of the CR instruction are confounded by differences in the populations.

There are five particular problems with the Compensatory Reading Study of which readers should be aware. The implications of these problems are discussed in more detail in a companion document (McLaughlin, Gilmartin, and Rossi, 1977). First, analyses were based on instructional group means; those means included different individuals at pretest and posttest administrations; and the types of individuals who tended to miss one or the other of the tests were significantly lower achievers than those who were present for both tests. Thus, comparisons between compensatory and regular reading instructional groups were affected in unexplained ways by student mobility. Second, posttest scores tended to be much more variable among children with low pretest scores than among children with moderate or high scores. This "heteroscedasticity" is an important violation of the assumptions underlying the analytical method used (analysis of covariance). Third, there was a ceiling effect that operated mainly in the regular reading instructional groups: students who obtained perfect or nearly perfect scores, especially on the posttest, may actually have gained much more than was measurable using the tests. The impact of this effect was complex because of the analyses used, and it may have caused the results either to be biased in favor of or against the compensatory reading instructional group. Fourth, the well-documented fact that children with lower achievement (at the time of the pretest) can be expected to learn at a slower rate than other children in the absence of a special treatment was not considered. In fact, the

statistical comparisons carried out by ETS (Trismen et al., 1975) were aimed purely at the alternative criterion level #4 out of the seven levels listed above. Subsequent analyses by USOE (USOE, 1976b) considered other alternatives. Finally, there was the problem of "differential regression to the mean", discussed in detail, for example, by Campbell and Erlebacher (1970). To put it simply, tests do not measure perfectly; they all have some random error; and that error, by the nature of the evaluation design used, tends to make it appear that groups move farther apart from pretest to posttest. Because the compensatory reading instructional groups started out with substantially lower achievement scores, this means that, *ceteris paribus*, they would tend to appear further behind at the time of posttest. Readers should be cautioned in interpreting these five problems that they are more complex than these very brief descriptions might imply. There are arguments and counterarguments that must be taken into consideration before a final judgment of the validity of the study's results can be made. It is this author's opinion, however, that these and other problems seriously impair the utility of the study.

In spite of these faults, the Compensatory Reading Study results rule out two of the answers to the question posed--the first and second. One could consider that the problems noted constitute not so much an indictment of the Compensatory Reading Study as a demonstration of the small difference between different criteria of success. In the Compensatory Reading Study, the difference in posttest score means between results indicating the third answer (closing the gap) and the fifth answer (falling further behind) was less than one-fifth of a standard deviation (for total MAT score in the fourth grade). While sufficiently large sample sizes can ensure reliability sufficient for the detection of a difference this small, there are numerous threats to validity that have effects larger than this. For example, the effects of attrition might not have been critical in the search for large effects (85% of students with either pretest or posttest scores had both), but in this study the differences in results that might be due to nonresponse bias were larger than the sizes of effects sought. Therefore, an accounting of nonresponse bias should have been included in the statistical model used for analyzing program effectiveness.

A point that should be emphasized concerning most of the other studies presented in Table 1[illegible] the importance of the distortions caused by reliance

on grade-equivalent scores for analyses. Detailed discussions of these distortions are included in McLaughlin, Gilmartin, and Rossi (1977) and need not be repeated here. To provide a brief image of the problem, one should realize that if the average grade-equivalent gains reported for one group are greater than for another, it could be that (1) the first group learned faster, or (2) the teacher of the first group focused on helping the faster learners in the group, or (3) the raw scores were translated into grade-equivalents before averaging in the first group and after averaging in the second group, or (4) the two groups were at different stages of development.

Due to the many methodological problems in addressing the question of general effectiveness of compensatory education through treatment/control comparisons, it is questionable whether effectiveness can ever be validly assessed by this method. It is important, however, to have some form of answer in order to guide decisions on allocation of national resources. Would education for disadvantaged children improve with a large increase in Title I appropriations? Would it deteriorate if Title I were abandoned? The answers to these policy-relevant questions relate to effectiveness, but only indirectly.

Consider the expansion of Title I: one basis for expansion would be evidence not for general effectiveness but for the effectiveness of particular methods at a few sites, which would meet the needs of greater numbers of children if their widespread dissemination and utilization could be subsidized. The identification of particularly effective methods is discussed in the next section of this synthesis. Another basis for expansion would be evidence that only a fraction of the target population was receiving services. This requires data, not on general effectiveness, but on participant selection procedures. A third basis for expansion would be evidence of a correlation between cost-per-student and gains. This, again, does not require demonstration of the general effectiveness of the program.

On the topic of general cost-effectiveness, results have been equivocal due primarily to limitations on the validity of effectiveness measures. The cost-effectiveness study in the CRS reached the conclusion that "no relationships were uncovered between cost and program effectiveness. However, this is not conclusive proof of no relationship. Our inability to find such a relationship may be the direct result of the limitations in the data" (Flynn et al., 1976, p. xix). In one study of California projects, Tallmadge (1973)

found no significant correlation between cost and effectiveness, and in another, Kiesling (1972) found a significant relation only when the expenditures were for particular methods.

Consider the abandonment of Title I. First, we need to differentiate between (real) abandonment of special efforts to improve the achievement of educationally disadvantaged children in poverty areas and (apparent) abandonment of the current program in favor of a new effort. One basis for real abandonment would be the finding that nothing works; if not a single demonstratic of an effective method could be identified, the usefulness of the large effort would have to be reconsidered. Again, general effectiveness is not the issue. In actuality, there are a number of different treatment methods that have proven potentially effective, at least in some settings. Another reason for real abandonment would be a finding that the need no longer exists: many expenditures are one-time expenditures, and if the major need is for retraining or re-equipping teachers rather than for more teacher-student interaction time, then it might be reasonable to expect the need for federal effort to decline. The evidence needed for this decision is related to services and service-effectiveness, not general effectiveness. Because there are still many low achievers in low income areas, the need remains; and the most generally agreed upon category of service, providing more teaching time for each disadvantaged child, is clearly a recurring expenditure.

The apparent abandonment of Title I in favor of a new effort, which is merely a method for shifting the administration of an effort to a new system of individuals, is one policy area for which general program effectiveness is relevant. If, within the budgetary limits, there is a substantial discrepancy between the expected results of the program and its actual effectiveness, and if the expectations are valid, then changes are warranted. (Whether they should be "formative" changes in which new methods are tried within the Title I structure or "summative" changes consisting of complete reorganization of the effort is a question beyond the scope of this synthesis.)

So far, although incremental changes have been made in response to the lack of demonstrated effectiveness of Title I, no large-scale reorganizations (e.g., eliminating the role of the state education agencies in program administration) have been undertaken; rather, the validity of expectations and of evaluation data have been questioned.

In summary, Title I has not lived up to the expectations of the optimists of 1965, which has caused a hard look to be taken at the assumptions and objectives of the program and at the ways in which the performance of children in the program are measured. While the objectives have not changed greatly,* expectations have been lowered as the relative intractability of the problem has become apparent. Isolated instances of substantial impact have been identified, and USOE has taken steps to disseminate the concepts and practices in those instances to all school districts (e.g., the PIPs developed by RMC).

The assessment of the overall effectiveness of compensatory education, however, has yet to be accomplished. The current studies by USOE (the Sustaining Effects Study being carried out by SDC) and NIE can be expected to help answer the question of effectiveness.

Variation in Effectiveness with Treatment

Many different treatment methods have been suggested as crucial to successful compensatory education, based on an author's intuition or on hard experimental evidence or on something in between. Because so many curricula have been constructed without sound research and development and have failed in practice, schools are justifiably skeptical about spending scarce resources to implement new methods. Thus, in examining the various methods proposed, we shall try to assess the validity of their support and their replication costs.

There are four general problems to be dealt with before considering specific treatment methods: (1) the validity of supporting evidence, (2) particularly, the problem that several studies have focused only on positive instances, (3) the difficulty in specifying what the treatment methods actually consisted of, and (4) the problem of lack of focus on compensatory education.

Generally, the conclusions reached by evaluators about the relative effectiveness of different methods can be assumed to have greater validity than conclusions about overall effectiveness for two reasons, but less validity for a third reason. First, when comparisons are made, they are made on more nearly equivalent groups. Whereas evaluation of overall effectiveness has employed

* There has been a trend toward greater emphasis on intervention in the earliest grades, however.

comparison groups of more able students, alternative treatment methods are compared on a priori similar groups of students. For example, in the Compensatory Reading Study, the comparison of compensatory instruction delivered separately or in a class combined with regular instruction was subject to fewer threats to validity than the overall comparison between compensatory and regular instruction for this reason. Second, the demand characteristics of the studies of overall program effectiveness, sponsored as they have been by the administrative agency responsible for program management, ensure that conclusions about program effectiveness will suffer loss of credibility, whether or not warranted. This loss of credibility does not pertain to the relative comparisons of different treatment methods, however, because the agency does not stand to gain from any particular finding.

On the other hand (the third reason), with the exception of the studies by Gordon and Koutrelakos (1971), McLaughlin (1971), and Guthrie et al. (1976), the question of which treatment methods were most effective was of secondary importance to some other goal of the study, and less care was taken in arriving at answers to this question than to others. The selection of which dimensions of treatment methods to investigate, and even in some cases what evidence to accept was frequently subjective. For example, in qualifying their conclusions about relative treatment effectiveness, Hawkridge, Tallmadge, and Larsen (1968) cautioned that "investigator bias may have influenced the analysis of data from the programs."

One serious source of misinterpretation may, in fact, invalidate all conclusions about the effectiveness of methods based on field observations rather than controlled experiments. Lip service is frequently paid to the concept that correlation does not imply causality, but that caution is ignored in many research or evaluation situations because the particular causal explanation offered for a correlation is more plausible than any of the alternatives. The evaluation of compensatory education is not one of those situations.

First, different methods are usually applied to groups that, though similar, are not exactly equivalent. Therefore, whenever one method appears to be more closely related to achievement gains than another, it is plausible to argue that this was because the students receiving the first method were likely to gain more in any case. As noted above, group nonequivalence is less

likely to distort comparisons between compensatory treatments than comparisons between compensatory and regular treatments.

Second, and this is particularly damaging, any method that is flexibly and sensitively applied as the need arises in a particular child is less likely than other methods to appear to be correlated with achievement. In the extreme case, when a method is applied in such flexible amounts that each child's needs are exactly equally met, then each child will achieve at the same rate (except for random variation) and the correlation of the amount of the method and achievement gains will be zero!

To take an example, suppose that there are 20 students in a particular classroom, A; and

10 (fast learners) gain 1 month for every 20 instructional hours,

10 (slow learners) gain 1 month for every 40 instructional hours,

and the teacher spends 20 hours per month instructing the first group and 40 hours instructing the second; that is, s/he responds in complete sensitivity and flexibility to students' needs. Then all 20 students will gain the same amount, and no relation between instructional time and gains will be observable. Suppose on the other hand, there is another identical classroom, B, with 10 fast learners and 10 slow learners, and that within each class (A and B) instructional time is forced to be the same for all students, but that in classroom A, 20 hours per month are devoted to the particular instruction while in classroom B, 40 hours are devoted (because, say, an extra teacher is available). Then the average gain per month in classroom A will be 3/4 month and in classroom B will be 1-1/2 months. In this case, there is a perfect correlation between instructional time and gain. Thus, the likelihood of the effectiveness of a method's being observed is greatest when its application is inflexible! That is especially ironic for research on compensatory education.

Turning now to the second of the four methodological problems, the focus on positive instances, we must note that in some cases results have consisted of descriptions of effective programs without comparison with ineffective programs. Finding that a method is present in effective programs constitutes only very tentative evidence of its relation to effectiveness: one must then determine whether the method is also present in ineffective programs. This

problem is especially important for making inferences from exemplary projects, such as the "It Works" searches, Follow Through planned variations, the PIPs effort, and the part of the Compensatory Reading Study that focused in-depth observation on five effective schools. The problem was recognized in the "It Works" searches, as Hawkridge, et al., (1968) carried out a supplementary comparison between selected projects and similar but unsuccessful projects. Conclusive evidence on the contribution of a particular method must include comparison between the method and a situation that is the same except for absence of the method.

The third problem concerns the specification of what the treatment methods actually consisted of. As pointed out in the Follow Through evaluations and in the LONGSTEP study of innovative education, the content of an implementation of a method cannot be validly inferred from some label assigned to it, but must depend on careful observation of the process. Individualized instruction, for example, can vary from careful diagnostic testing followed by highly structured, relevant instruction sequences to a laissez-faire environment in which the student does what he or she chooses to do. Another problem is that the specification of some methods is multidimensional, such as in the "It Works" series, in PIPs, and in the Follow Through planned variations, so that it is difficult to determine which are the crucial components of effective methods. The careful research studies, such as those reviewed by Gordon and Koutrelakos (1971), are ultimately of more value in addressing this question than comparisons of vaguely specified methods in actual operation. Although one can question the generalizability (external validity) of results from controlled experiments, they at least provide the firm foundation of basic knowledge about the learning process upon which curricula can be developed and put into practice.

The fourth problem concerns the general lack of focus on methods specifically designed for compensatory instruction as opposed to instruction in general. Nearly all the recommended strategies, such as careful planning, clear objectives, individual attention, and inservice training, apply to instruction for any students in any situation. Perhaps those who make the recommendations have felt that there was a general need to improve instruction, or perhaps there are no distinct treatments that help only disadvantaged children, but it would seem important to isolate particular methods for dealing with the particular problems faced by educationally disadvantaged children, if possible. The only

treatment method clearly recommended by several sources and clearly of particular relevance to disadvantaged children is the fostering of support in the home for the child's learning. One possible reason for the lack of focus on the particular problems of the disadvantaged is the political connotation of pointing out those problems. The reaction to Arthur Jensen's recommendation that disadvantaged children should be taught by different methods because they have different learning capabilities should be sufficient to warn any politically astute researcher to avoid this area carefully. It is unfortunate for the disadvantaged children of today that such research into differential teaching methods has been tainted by the association with racism it has inherited from genetic or heritability research.

Various treatment methods found effective in studies of compensatory education are shown in Table 18. Because of differences in terminology across different studies, we have chosen to define a set of categories of treatment method, and the names of the methods require some clarification. The method of "more teachers" refers to lowering the teacher:student ratio, possibly to the point of allowing individual instruction. It does not refer to the use of teacher aides or parents or peer tutors for instruction. Evidence presented by McLaughlin (1971) suggests that parental involvement in the classroom may primarily be for the purpose of helping the parent to help her/his own children to learn. Evidence from Follow Through (Anderson, 1977) suggests that peer tutoring may not be a particularly effective strategy. Gordon and Koutrelakos (1971) noted two peer tutoring projects in New York City that had mixed results.

The term "more time" refers to the amount of relevant instruction received in a specified time period, such as a year. Wiley and Harnischfeger (1974) have made a strong case for the importance of time as a determinant of achievement. Data on time spent in a compensatory reading (or math) program are particularly questionable, however, because of the necessity of careful records of absences, the necessity of assuming students' attention to a topic is closely related to a teacher's focus on the topic, and the necessity of recording time spent in related activities, such as a regular reading (or math) program. Moreover, the result found by Guthrie et al. (1976) and by Coles et al. (1976) that there is a positive relationship of instructional time and achievement only in the early grades suggests an artifactual explanation: Possibly, more time was spent in the upper grades with just those

problem is especially important for making inferences from exemplary projects, such as the "It Works" searches, Follow Through planned variations, the PIPs effort, and the part of the Compensatory Reading Study that focused in-depth observation on five effective schools. The problem was recognized in the "It Works" searches, as Hawkridge, et al., (1968) carried out a supplementary comparison between selected projects and similar but unsuccessful projects. Conclusive evidence on the contribution of a particular method must include comparison between the method and a situation that is the same except for absence of the method.

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Table 18

Methods Reported as Effective for Compensatory Education

Study	Method												
	More Teachers	More Time	Basic Skills Direct Relevance	Individual Prescription	Clear Objectives	Mixing Students	Parental Involvement	Quality of Administration	Use of Rewards	Human Concern	Inservice Training	Innovation	Remedial Specialists
"It Works" (1968)	✓	✓[1]	✓	✓	✓			✓					
Gordon & Koutrelakos (1971)	✓	✓[1]	✓	✓	✓		✓			✓			
McLaughlin (1971)	✓	✓[2]	✓	✓			✓[6]				✓		
AIR Synthesis (1972)	✓	✓[1]	✓	✓	✓		✓	✓			✓		
Compensatory Reading[8] (1976)			✓			✓		✓[7]					
Follow-Through (1977)			✓	X					✓				
ESAA In-Depth Study (1976)				X	✓		✓	✓	X				✓
LONGSTEP (1976)		✓[3]		X								X	
Guthrie (1976)	✓	✓[3]	X[4]	✓	✓[5]			✓					

✓ = positive effect observed X = less than expected effect observed (e.g., none) (blank) = no clear results from the study

[1] referred to as "high intensity"

[2] amount of time the child spends reading

[3] especially in early grades

[4] instructional emphasis had less effect than instructional time

[5] breaking the reading task into "subskills"

[6] must involve parents actively in supporting children's learning

[7] included strong leadership, high priority of basic skills, and cross-fertilization of ideas across grades

[8] attributes of 5 effective schools; see text for other results of the CRS

students who were the most in need of that time. As a result, according to the discussion at the beginning of this section, the negative results in the upper grades are questionable.

There is nearly unanimous agreement that "directly relevant instruction" that attends to basic skills is crucial to achieve impact. This finding should be completely obvious, because it is the teaching of these basic skills that the schools are responsible for and that achievement tests directly assess. At many times, however, especially in the 1960s, there has been an emphasis on other goals for the schools, such as building an individual's self-image, emphasizing cultural heritages, or promoting more "relevance to real life." In the late 1970s, there is a growing realization by the public of the implications of these findings and an increasingly stringent call for schools to teach "the basics."

The next column in the table, "individual prescription," refers to methods that are particularly tuned to the special needs of individual students. It has been referred to as individualized instruction and as individual diagnosis. Although individual prescription has been cited as effective in several studies, other studies have found it to be ineffective. In fact, with a given amount of time for instruction, the teacher who spends more time with the slower students is not likely to increase the class average achievement gains. Logically, spending most time with the fastest learners should maximize class average gains. Studies of individual prescription are needed that are more sensitive to individual performance gains than are existing studies.

The next process in Table 18 refers to "clear objectives." Gordon and Koutrelakos (1971) referred to this as the need for teachers to have more planning time. This is a particularly difficult process to assess because many teachers have "clear objectives" that they are not easily able to translate into behavioral terms, either because of the multiplicity of different behaviors that they accept as alternative indicators of learning or because they do not wish to emphasize the differences in goals they set for different children by making them explicit. It may be that, where a teacher's ability to verbalize clear objectives is related to effective instruction, it is because stating clear objectives is itself an indicator of understanding of the children's learning process. On the other hand, possessing clear objectives does provide

teachers with a basis for continuing assessment of their rate of progress toward their teaching goals.

"Mixing students" refers to providing instruction to children with different ability levels within the same classroom setting. The results of the Compensatory Reading Study indicated that mixing students was related to significantly greater achievement gains by compensatory students with no corresponding loss by noncompensatory students. Although these results were obtained by the same analyses that were evaluated as likely to be invalid for deciding whether compensatory instruction was generally effective, in the present case they are more nearly valid because the two groups being compared are more nearly alike at the time of pretest. The distortions due to nonequivalence of treatment groups are greatest when the groups are most different from each other.

"Parental involvement" refers to several different tactics, such as involvement in project planning, presence in classrooms, and learning to teach in the home. Milbrey McLaughlin (1971) distinguished between effective and ineffective methods for parental involvement: the former emphasize the content of involvement, whereas the latter emphasize the form of the involvement. For parents to learn how to help their children by being present in the classroom, they need to do more than clear erasers and take attendance. However, it has been pointed out by Hiatt (1977) that if the parent is being counted upon as a classroom resource, greater instructional effectiveness is achieved by assigning menial, nonprofessional tasks to the parent. Thus, different reasons for parental involvement (to educate the parent or to help the teacher) are in conflict. Results appear to indicate that teaching parents how to teach their own children may be very important. However, if this can only be accomplished by involving parents directly in classroom teaching activities, compensation is needed for the children who are therefore receiving less professional teaching exposure. Perhaps the use of curriculum materials that are foolproof for use by nonprofessionals is a solution. Such materials have not yet been developed.

"Quality of administration" has been noted as an important contributor to effective programs. The authors of the Compensatory Reading Study (Trismen, et al., 1976) placed a great deal of emphasis on this factor, assigning it

greater importance than the quality of individual teachers. Although it is fairly obvious that systems generally benefit from good administration, the school setting is particularly dependent on good administration because of the opportunities for cooperative maximizing of "productivity" as children carry their particular needs and resources from one teacher to the next.

"Use of rewards" refers to explicit positive reinforcement of children for the achievement of learning goals. The use of rewards was a strategy characteristic of the more effective variations in the Follow Through planned variation study. This is distinct from the "human concern" that Gordon and Koutrelakos (1971) called for in compensatory education. It may be true that children need positive reinforcement in order not to become discouraged in school, and more specifically, the behaviorist point of view would suggest that the positive reinforcement should be contingent upon achievement gains. On the other hand, some research (e.g., Lepper, Greene, and Nisbett, 1973) suggests that external reward may be harmful to learning when children already possess intrinsic interest in the tasks to be learned. More research into the level of motivation children have for learning basic skills and how motivation relates to educational and economic disadvantage is needed.

"Inservice training" has been reported to be valuable when it is oriented to the particular methods to be used in a compensatory education project. New methods require more than superficial attention by teachers if they are to achieve the outcomes for which they are intended. One finding of the PIPs evaluation (Stearns, 1977) was that the best implementations of packages occurred when local groups internalized and "re-created" the packaged methods rather than trying to follow written directions.

Finally, a recently completed longitudinal study of "innovation" in the schools (Coles et al., 1976), although not directly aimed at compensatory education, found a somewhat negative correlation between the innovativeness of a school's program and the level of achievement of the students.

As a part of the Compensatory Reading Study (not included in Table 18), 29 schools were selected from among the most effective and least effective schools, and various characteristics of the classrooms in these schools were observed (Trismen et al., 1976). The correlations of process variables with

effectiveness (measured as achievement scores) varied across grades 2, 4, and 6. In second grade, the most salient correlates of effectiveness were inequality of teacher attention to different children, adult centeredness of the classroom, and positive classroom affect. In fourth grade, the most salient correlates were adult centeredness, but without the use of punitive control. In the sixth grade, the most salient correlates were student autonomy, lack of teacher warmth, and lack of positive classroom affect.

An adequate summary of all the research potentially relevant to compensatory education is beyond the scope of this presentation. Readers are referred to Gordon and Koutrelakos' synthesis (1971) for a more extensive coverage of the research up to that time. The present study focuses on the federal evaluation studies, and due to the quasi-experimental and correlational nature of those studies, the recommendations to be obtained from them should be considered tentative and in need of careful verification before widespread utilization--not just to refine and sharpen generalizations but also to determine whether those generalizations are possibly completely misleading. Many of the results have an aura of obviousness, such as the need for a lower teacher:student ratio, for more instructional time to be directed to basic skills, for a high quality of administration, and for sensitivity to individual students. Perhaps the most unexpected result is the recurrent finding that parental involvement is important; apparently, education is not an endeavor that schools can undertake alone.

More refined information about the relative effectiveness of different treatment methods is clearly needed, and rigorously designed experimental studies are the only means of obtaining that information. Such studies need not be large nor exactly nationally representative; they must, however, rule out the alternative explanations that so often lead to ambiguous conclusions.

Variation in Effectiveness among Types of Participants

This is really a double question: first, are there some characteristics of students that have been found to predict their success or failure in compensatory education settings; and second, are there characteristics of certain individuals that call for use of particular methods of compensatory education for them? It is certainly the case that all children are not alike and that there are many ways to learn basic skills, and to suppose that compensatory

education by any method would be equally effective for all is absurd. Indeed, a key concept in many of the successful projects identified by Hawkridge et al. (1968) was sensitivity to individual problems and adaptive treatment for those problems.

Identification of general traits that are correlated with success or failure of compensatory education could be dangerous as well as useful. The danger lies in applying the generalization to all cases, which can be a substitute for careful individual diagnosis. While in some cases it is defensible to apply the generalization to individuals (e.g., blind children will of course not be able to learn from visual materials), in most cases it clearly is not defensible (e.g., the generalizations that girls learn language arts more quickly than boys or that white learn more quickly than blacks). The usefulness of generalizations lies at broader levels. First, if certain segments of the population are shown to benefit most from compensatory education, then resources should be allocated to treat all who need it in those segments, and research should be focused on new forms of compensatory education for other segments. As a hypothetical example, if it were found that known compensatory education methods produce dramatic gains in mathematics for girls who are behind in mathematics but not for boys, then the program could attain its greatest effect on mathematics achievement by focusing instruction on girls while supporting development of new methods of teaching boys. Second, comparisons of different projects and their methods could be made more nearly fair by taking into account differences in expectations of success between the treated populations. In the same hypothetical example given above, if one project were dealing with classes of 60% girls and another project 60% boys, this discrepancy might mask any greater effectiveness of the second project.

In its bilingual education program and its aid to education for handicapped children, the federal government has, in fact, identified particular populations and allocated resources specifically to them. Those allocations are in terms of needs, however, not in terms of expectation of success. Information on expectations of success has yet to affect legislative direction of aid to particular segments of the population. One reason may be that lack of information on differential expectations of success. In none of the central studies reviewed was this question addressed, although the Compensatory Reading Study collected data that would allow one to compare effectiveness across

subpopulations. This lack of information indicates the implicit recognition by the federal government and, in particular, by the program administrators of the danger of such information becoming a basis for teachers to respond to children in terms of stereotypes. However, that danger is far outweighed by the potential, both short-term and long-term, for improving the level of achievement of the nation's disadvantaged pupils.

Five dimensions of variation among compensatory education participants appear worthy of investigation: (1) level of economic disadvantage, (2) ethnic group membership, (3) sex, (4) urban or rural context, and (5) grade level of treatment. In order to provide conclusive evidence concerning the relations of each of these with the effectiveness of compensatory education, carefully controlled studies would be necessary. Tentative hypotheses and directions for further research, however, could be developed from further analyses of the results of studies such as the Compensatory Reading Study.

The level of economic disadvantage might be expected to relate to the effectiveness, for example, of home-oriented compensatory education methods. Educationally disadvantaged students from less impoverished home environments might (hypothetically) derive less benefit from such programs than students from severely impoverished homes, suggesting that home-oriented programs be especially recommended for areas of most extreme poverty. (But we do not know that, because the appropriate study has still not been done.)

Studies of differential learning patterns between blacks and whites have been controversial. Questions concerning the relative effectiveness of compensatory instruction vs. regular instruction for different ethnic groups are not nearly so controversial, however. They can be addressed by making comparisons of treatment and "control" groups within ethnic groups and then evaluating the results across ethnic groups. If it were found, for example, that *ceteris paribus* the effectiveness of known compensatory education methods was greater for blacks than whites, then allocating greater funds to regions with greater concentrations of disadvantaged blacks while supporting development of better methods for dealing with the needs of disadvantaged whites would increase the effectiveness of a compensatory education program such as Title I. (Again, we found no evidence relevant to this question in the studies reviewed.)

Similar results for the two sexes or for students in different types of community settings (large city, small city, suburban, and rural) might be expected. Different types of children in different environments are, to a certain extent, likely to have correspondingly different deficiencies requiring particular remediation. The more exactly particular problems or special needs of categories of disadvantaged children are identified, the more effectively choices of allocation of Title I funds can be made. This is the same principle that underlies the use of individually prescribed instruction at the individual student level.

The dimension of grade level is unlike the other dimensions, primarily because every child passes through every grade level. Thus, the danger of stereotyped response is not as clearly present for this dimension; in fact, data on the relative effectiveness of compensatory education at different grade levels have been reported in several studies (e.g., Wargo, et al., 1972; Gamel, et al., 1975; Thomas and Pelavin, 1976). Whether the youngest school children should receive the bulk of compensatory education efforts, as they do, relates to basic assumptions of the Title I program. If children who participate in compensatory education thereby become able to join the mainstream of instruction in the schools, then it is obvious that efforts should be heavily concentrated at the earliest stages. However, if joining the mainstream is not possible (and evidence suggests that it is not with present instructional strategies), then the goal of the program ought to be to ensure that all economically disadvantaged children leave school with the highest level of skills the schools can help them to attain; that implies a continued effort across all grade levels. Larson and Dittman (1976) have discussed this problem. Two possible criteria for allocation across grades are (1) relative needs and (2) expectations of gains in achievement to result from compensatory instruction. Establishment of relative need is extremely difficult (e.g., there will be 10% of the children in the bottom decile at all grades), because it must be based on an acceptable theory of normal growth in cognitive achievement. Although Carroll (1974) has worked on such a model, more research is needed. Likewise, establishment of expected gains is problematic because of the lack of an absolute scale on which normal growth in different grades can be compared. Data presented by Thomas and Pelavin (1976) and cited by Larson and Dittman (1976) would appear to suggest that larger gains from compensatory

education occur at the higher grade levels. Thomas and Pelavin found grade equivalent gains of 1.0 to 1.1 in grades 1 through 6 and of 1.1 to 1.4 in grades 7 through 12. Wargo, et al., (1972) reported grade-equivalent gains from seven annual state Title I reports in 1969 and 1970 that averaged .9 for second graders, 1.0 for fourth graders, and 1.1 for sixth graders. Gamel et al., (1975) reported grade-equivalent gains for 1971 through 1974 that ranged from about 1.0 to 1.2 for grades 1 through 6 and from about 1.1 to 1.8 in higher grades.* Results are probably artifactual, however, because they were based on grade-equivalent gains: for example, a child who moved up from the 20th percentile to the 30th percentile during the second grade may actually have appeared to learn at a rate of only 0.9 months of achievement per month of instruction (compared to the average, or 50th percentile, student), while a ninth grader who moved from the 20th to the 30th percentile in a year might appear to have learned at a 2.0 month-per-month rate. (This artifact is discussed in McLaughlin, Gilmartin, and Rossi, 1977.)

Summary

Although little is known about the differential effectiveness of compensatory education for different types of children, such information would contribute to improving the effectiveness of compensatory education programs by focusing allocations of particular resources where they would be most effective. It would also help to improve the validity of evaluations and to identify the most critically needed research and development.

Use of such information as an input to the further development of Title I policy must be made in the context of the multipurpose nature of this program: it may be that, although effectiveness in terms of achievement gains is greatest for one segment of the population, program impact in terms of truancy or violence reduction may be greatest in a different segment. To the extent that a consensus on the relative importance of different purposes of Title I can be reached, however, information on how most effectively to attain those purposes is relevant, including information on differential effectiveness across population segments.

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* Gains based on fewer than 300 actual students were not included.

Major Problems

One cannot hope to improve a system without first identifying its problems. The facilitative impact of policy changes will depend on the extent to which those changes address the system's most serious problems. Therefore, in this section we reiterate the problems for Title I operation raised in the previous sections along with other problems pointed out in the studies reviewed, in order to provide whatever basis for policy planning can be distilled from federal evaluations of compensatory education to date.

Because problems have been pointed out at various times throughout the last decade, it is necessary to discriminate between the transient and enduring problems; the latter are the more important considerations for future planning. Also, rather than leaving the reader to infer that problems not mentioned have not occurred, we shall try to list potential problems that have apparently not occurred. Finally, in order to guide search for solutions, we have attempted to point out relations among the problems (e.g., "A" is a problem only so long as "B" is a problem).

Three studies that have not been mentioned in previous sections because their results do not add to our knowledge about participant characteristics, treatment delivery, or evaluation reporting provide the clearest statements of some of the problems in Title I operations: the Washington Research Project report (Martin and McClure, 1969); the Planar reports (1972; 1973); and a historical study of the USOE role in Title I evaluation during the first five years (Milbrey McLaughlin, 1975). In addition, the reports by Wargo et al. (1972), Gamel et al. (1975), and GAO (1975) have focused on identification of particular problems, however, in any of the studies reviewed.

Administrative Problems

1. Misuse of funds. Especially in the initial year of Title I, and

continuing through the first few years, there were numerous instances of use of funds for purposes other than those intended. The Washington Research Project report (Martin and McClure, 1969) named and described many such cases, and the DHEW Audit Agency identified many examples of noncompliance each year. Clear cases were uncovered of use of funds either to purchase resources that were used by nondisadvantaged pupils or to purchase resources for disadvantaged pupils that other district funds purchased for nondisadvantaged students. According to the Planar study, however, many of the audit exceptions were nonsubstantive violations due to inconsistent signals from USOE and the Audit Agency. Of a total of $174 million in audit exceptions since 1965, only about $8 million were sustained on review, and only about $700,000 has been returned to the treasury (NACEDC, 1976). In recent years, federal administrators report only rare instances of clear misuse of funds; although audit exceptions continue to occur, they are small or nonsubstantive. This is true in spite of the fact that there has been only very mild federal action taken in cases of misuse of funds (other than generally to make regulations tighter for all). Rather than request return of funds to the treasury, the NACEDC has recommended that they be spent to help disadvantaged children in the district found to be not in compliance. Technical assistance would be provided to help the district comply.

2. Lack of consistent federal regulations and guidelines. The Planar reports carefully examined the federal administration of Title I in 1972 and found not only hundreds of instances of vague and indeterminate language in the regulations and guidelines* but also a lack of orderly process in the development of regulations and a lack of awareness of reality in the requests made of local dsitricts. In September 1976, USOE published a draft of new regulations for Title I and invited comments. At this time, it is not clear whether these regulations are satisfactory improvements on prior regulations.

3. Invalid evaluations. Title I broke new ground not only in sending substantial federal aid into most school districts across the country but

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*Regulations are formal extensions of the law, and guidelines are administrative suggestions for procedures. Both are published by USOE, and at times the practical distinction between them has been lost.

also in requiring each local project to conduct annual evaluations of its use of the money. As the companion document on evaluation methodology (McLaughlin, Gilmartin, and Rossi, 1977) shows, valid evaluation of compensatory education's impact on children is extremely complex, requiring not only rigorous data collection but also testing of numerous subsidiary assumptions and performing analyses not included in standard statistical texts. As discussed in that methodological presentation, the only valid comparisons of Title I treatment groups with control groups have been the rare cases of randomly assigned treatment and control pupils. Absolute criteria for successful impact have not yet been developed.

As Wargo et al. (1972) and Gamel et al. (1975) pointed out, the existing reports cannot be aggregated to produce a national summary. USOE has taken steps to solve at least part of the evaluation problem, the need to have well-specified, comparable evaluations carried out at all project sites, so that results can be aggregated to form an overall assessment of Title I impact. USOE contracted with RMC Research Corporation in 1974 to develop and package evaluation data collection and analysis models to be used by districts throughout the country and then established regional technical assistance centers in 1976 at which evaluation experts would deal with the problems of implementing the RMC models. Although substantial problems of validity remain, a significant step has been taken to provide meaningful information from local Title I evaluations.

4. Lack of a strategy for developing effective methods. When the ESEA of 1965 was passed, it was expected that professional educators would be able to translate the additional funds flowing into the schools into effective compensatory education practices. Therefore, the law did not include a strong research and development component, and it was not until 1968 that a project was set up to identify successful practices in existing projects (Hawkridge et al, 1968). At about the same time, the Follow Through Planned Variation study was initiated in order to compare alternative methods for achieving lasting effects of early childhood basic skills instruction. However, neither effort developed into a comprehensive program to investigate the most effective configurations of alternative methods. Other efforts, the PIPs development and NIE's Basic Skills Division's research program, have also not been developed as comprehensive, systematic efforts to determine

the most effective methods.

Weikart and Banet (1975) have suggested that a 10- to 12-year research and development effort is necessary in order to produce a curriculum that is clearly successful for a broad range of children. Such a systematic R&D effort may well be necessary, because less rigorous and thorough attempts have yet to succeed. While it would be costly, such an effort would have the potential to dramatically improve the overall impact of compensatory education. A clear plan specifying the concrete objectives and the methods to be used in such an effort is needed.

5. Lack of parental involvement. Although professional educators have been enthusiastic about participation in the Title I program, they have generally been less enthusiastic about sharing their role with parents. Although a case can be made that professional educators are the most competent individuals to design and implement education programs, parents in fact play a critical role in the education of their children, as pointed out by Milbrey McLaughlin (1971), among others. The few compensatory education projects that have involved parents in teaching their own children have generally been among the most successful. There is clearly a need for more extensive development of guidelines for the involvement of parents, based on a well-thought-out rationale for the most effective ways of their contributing to compensatory education. That rationale will need to involve an increased understanding of the actual processes that result in the strong correlation in society between parents' socioeconomic status and children's early academic achievement.

6. Lack of knowledge about individual differences in the processes by which children acquire cognitive skills. Statements like "If we can send a man to the moon, why can't we teach our children to read?" are commonplace. They display a fundamental underestimation of the complexity of the human mind. Although a trip to the moon is an extremely complex undertaking, it is based on known mathematical formulas and physical constructions. Analogous theoretical bases for human achievement are far more complex, and although a great deal is already known about the teaching of basic skills, a far greater amount remains to be learned. Existing compensatory education practices are merely heuristic, artistic guesses concerning what will work, and as pointed out in an earlier section, valid

data on the relative effectiveness of different compensatory education methods are virtually nonexistent.

The types of questions that must be answered include at least the following: What basic component skills constitute reading ability, for example? What alternative combinations of component skills can achieve the same performance? What are the processes by which basic component skills are acquired? Which component skills are easy or difficult to acquire? What is the range of individual differences on the potential for acquiring basic component skills, and what are the correlates of those individual differences? What external events lead to the improvement of basic component skills? What role does motivation play in the acquisition of various skills? What external events affect motivation to learn? What are the barriers that inhibit learning to read? What are the causes of these barriers? What types of learning processes occur in children as a result of interaction with teachers? To each of these questions and to many related questions, the literature in psychology, sociology, and education offer a plethora of preliminary answers. Perhaps a thorough review of the research literature would move a long way in the direction of production of knowledge necessary to develop effective compensatory education. Such a review was not included in any of the federal studies reviewed, although the Compensatory Reading Study included a narrow literature review (Farr et al, 1974).

7. Lack of effective compensatory instructional methods. This problem, which we argue is a consequence of not having solved the preceding problem, is the most crucial of all. If we had effective methods implemented across the country, then the achievement of disadvantaged children would be rising as intended by the originators of Title I, and the problems that remained would be of secondary importance. The Follow Through study and the PIPs evaluation were intended to provide demonstrations of methods that worked, but their results were not positive.

The argument that some methods have really been effective and that the fault lies in the imprecision of measurement has been frequently voiced and was discussed in the section of general effectiveness, above. It is certainly true that, after the first and second grades, individual differences in achievement among pupils in a single grade greatly exceed the

amount that is learned during a single year on the average. As pointed out by Tallmadge and Horst (1977), the potency of instruction that would bring pupils performing at the 15th percentile up to, say, the 40th percentile would have to be much greater than the potency of normal instruction. However, that level of potency is what was desired by the proponents of compensatory education, and demonstrating a method for achieving it even though at more than moderate expense would provide the rationale for increasing the compensatory education effort to meet the special needs of all educationally disadvantaged children in poverty areas.

8. Special educational needs outside of low-income areas. Not only are there many children from moderate-income families who have need for compensatory education, but also there are many children from low-income families who reside in communities whose general economic level excludes them from Title I participation. Although there is a correlation between educational and economic disadvantage, and although a large proportion of the low-income families are clustered in low-income areas, limiting the aid to low-income areas excludes millions of children from the program who might benefit from it. In fact, too rigid an interpretation of the comparability regulations may inhibit school districts and states from providing other aid to these millions for fear of losing the much needed Title I assistance.

The problem is not easily solved. For one thing, providing a program for just a few children in a school is much less efficient than providing a program for many children; funding based on the number of economically disadvantaged children served would not add up to the minimum needed to implement any kind of effective project in many schools serving mainly affluent children. The solution has been proposed of changing the funding formula so that all educationally disadvantaged children, regardless of economic background, would have an equal share of the funds. The technical problems associated with that solution in the area of assessing educational disadvantage (e.g., are the same criteria applied throughout the country?) are substantial.

Nonexistent Problems

As a balancing note in this section, it seems appropriate to point out several problems that might have occurred in Title I, but do not seem to have actually occurred. First, there is no l[illegible] of manpower in the teaching field

to carry out instruction designed for individual pupils or small groups. There is, in fact, a large surplus of individuals trained as teachers, and the large proportion of Title I funds spent on teachers and teacher aides may reflect attempts to tap this labor reserve.

Second, there appears to be little difficulty in identifying low-income areas (at least approximately) and identifying children who are lagging behind their peers in the acquisition of basic skills. There is no question about the identification of need, although some argue that the priority of needs to receive federal attention may be misplaced. (For example, there have recently been suggestions for including aid to educationally disadvantaged children in high-income areas).

Third, local school districts have not been hesitant to participate in the Title I system. The additional focus of society's resources onto education is welcomed by educators, and the insistence that those resources be used to help the most needy students has not met substantial opposition, although cases of misuse of funds were identified in the early years.

Fourth, and finally, there has been no lack of ideas for ways to implement compensatory education. The breadth of ideas shown in the section on methods, above, indicates the fertility of the minds of professional educators. What needs to be done is a careful sorting of the essential effective components from the rest.

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Summary

This report focused on the results of approximately twenty central studies of compensatory education completed before 1977 and attempted to present the major results of those studies as they relate to important policy questions for Title I. As the authors of those studies have repeatedly pointed out, there are severe limitations on the validity of conclusions that can be reached using politically and economically feasible and available evaluation methods. Therefore, all the results presented should be viewed as estimates awaiting verification.

The results were presented first as they relate to the major tasks of Title I; participant selection, treatment delivery, and evaluation reporting. Then the results concerning program effectiveness were reviewed: overall effectiveness, variation in effectiveness as a function of treatment method, and variation in effectiveness across types of participants. Finally, a series of eight major problems in the implementation of compensatory education were identified and briefly discussed.

The primary concern in the area of participant selection is whether appropriate children are participating. The data that are available indicate that the 5 million participants each year tend to be those with educational and economic disadvantage. How perfectly participation matches needs cannot be ascertained because of inevitable errors in measurements of needs performed in evaluation studies. There are undoubtedly large numbers of children who would benefit from compensatory education who are excluded from the program, however, because they do not reside in "low-income areas." Reaching these children would require substantive changes in the law.

The design of compensatory education treatment methods has been a very decentralized effort, although federal efforts have recently increased (e.g., PIPs and the National Diffusion Network). As a result, many different

treatments have been tried. Forty projects that have been judged exemplary are briefly described in the text. The primary objective of most compensatory education projects has been to improve reading skills in the elementary grades, although substantial efforts in mathematics and other basic skills have been included. Noninstructional objectives, although prevalent in the early years of the programs, have become only a small part of the Title I effort in recent years.

The "agents" involved in providing compensatory education include teachers, teacher aides, parents, remedial specialists, peer tutors, and counselors. Compensatory instruction has taken place in regular classrooms, special classrooms, laboratories, homes, and field trips. Instruction has been teacher-centered, child-centered, structured, unstructured, in large groups, in small groups, and individual. Activities have included regular lessons, kits of special lessons, audiovisual experiences, games, toys, dramatics, tutoring, counseling, and parent training. These have been employed in many combinations as schools have tried to meet the needs of their educationally disadvantaged pupils.

Evaluation reporting has proven to be much more difficult than was expected at the outset of Title I. Many of the problems for compensatory education are discussed in a companion document (McLaughlin, Gilmartin, Rossi, 1977), and this topic was only briefly discussed in this synthesis. With the new emphasis on valid evaluations derived from the Education Amendments of 1974 (P.L. 93-380, §151), USOE efforts are currently directed toward improving evaluation by providing technical assistance to local districts in their efforts to carry out evaluations.

The information on overall program effectiveness, as measured in terms of increased achievement gains by program participants, has been less than adequate to determine how effective the program is. Of the studies reviewed (which did not include the current Sustaining Effects Study and the NIE evaluation of compensatory education), only the Compensatory Reading Study carried out by the Educational Testing Service had the potential for producing valid conclusions concerning achievement. Due to several severe problems with the interpretation of the data from that study, however, its conclusions cannot be accepted as definitive.

If we were to disregard the threats to the validity of the various reports

and accept their conclusions at face value, they have tended to be "hopeful." Much of the available data (which we believe to be questionable) supports the conclusion that Title I participants achieve at a rate comparable to non-disadvantaged children, which leaves them a constant distance behind the population average, but is a faster rate than disadvantaged children in general attain.

Concerning variation in effectiveness among treatment methods, the data also leave room for methodological improvement. However, there have been recurrent findings that should be noted. In general, treatment methods recommended for compensatory education are very similar to generally good educational methods (e.g., smaller student:teacher ratios, clear objectives, directly relevant instruction, good school administration). One exception to this is the emerging consensus on the importance of increasing parental involvement as an effective way of treating educationally disadvantaged children in Title I schools.

Concerning variation in effectiveness across population groups, little information has been reported. One apparent variation is that participating students in higher grades tend to show larger gains in grade-equivalent units than participants in earlier grades. This result is almost surely an artifact of the use of grade-equivalent scores in analyses of achievement.

Finally, the major problems listed for Title I, some of which are now apparently solved but others of which continue, include misuse of funds, lack of consistent federal regulations and guidelines, invalid evaluations, lack of parental involvement, lack of effective treatment methods, lack of a strategy for developing effective treatment methods, lack of knowledge about individual differences in the processes by which children acquire cognitive skills, and the exclusion of disadvantaged children not in low-income areas. Of these, the misuse of funds is the one which appears to have been eliminated. The adequacy of federal regulations, the validity of evaluations, the involvement of parents, and inclusion of all disadvantaged children could conceivably be ensured through appropriate congressional and administrative actions. The other three problems, which concern the development of effective treatment methods, could be expected gradually to yield to the implementation of rigorous, experimental designs for research and development, but are likely to remain as severe limits to Title I effectiveness without such efforts.

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